

TRANSPORTATION IMPROVEMENT PROJECT

CARLISLE ROAD

SIDEWALK IMPROVEMENTS

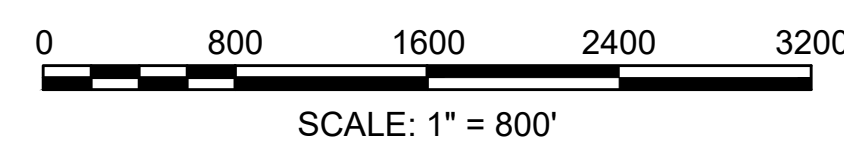
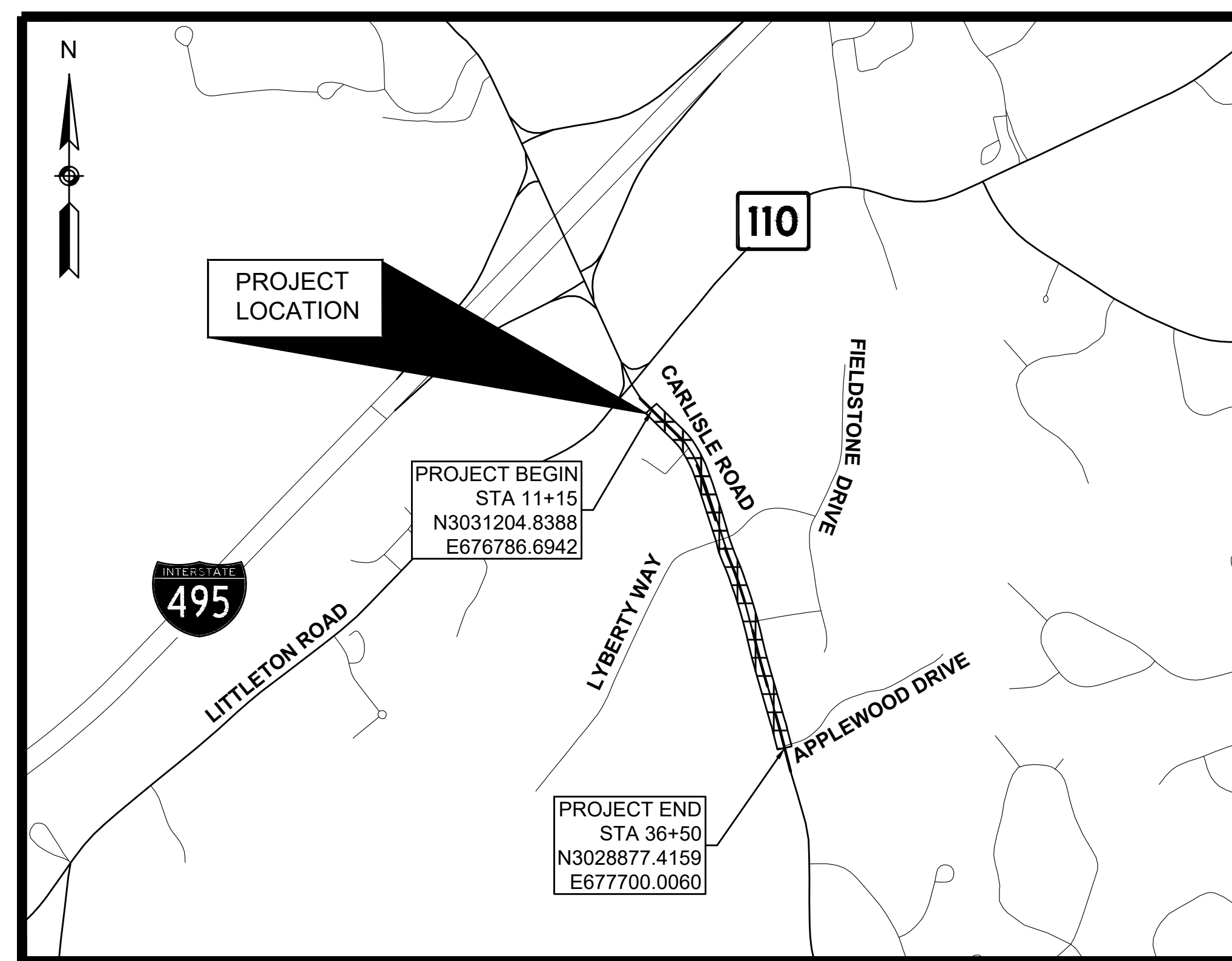
IN THE TOWN OF

WESTFORD

MIDDLESEX COUNTY

50% SUBMITTAL


INDEX	
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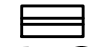







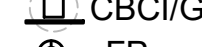



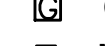





















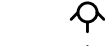

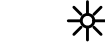





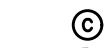





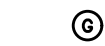

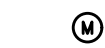

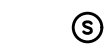

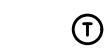

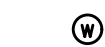

















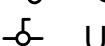

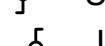

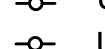











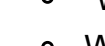

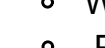

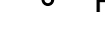





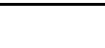

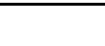

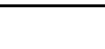



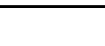

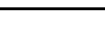



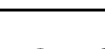



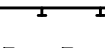

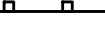

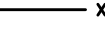

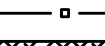





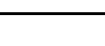

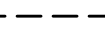

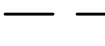

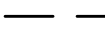








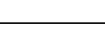
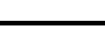

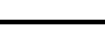
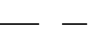
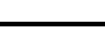
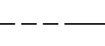

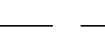

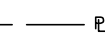



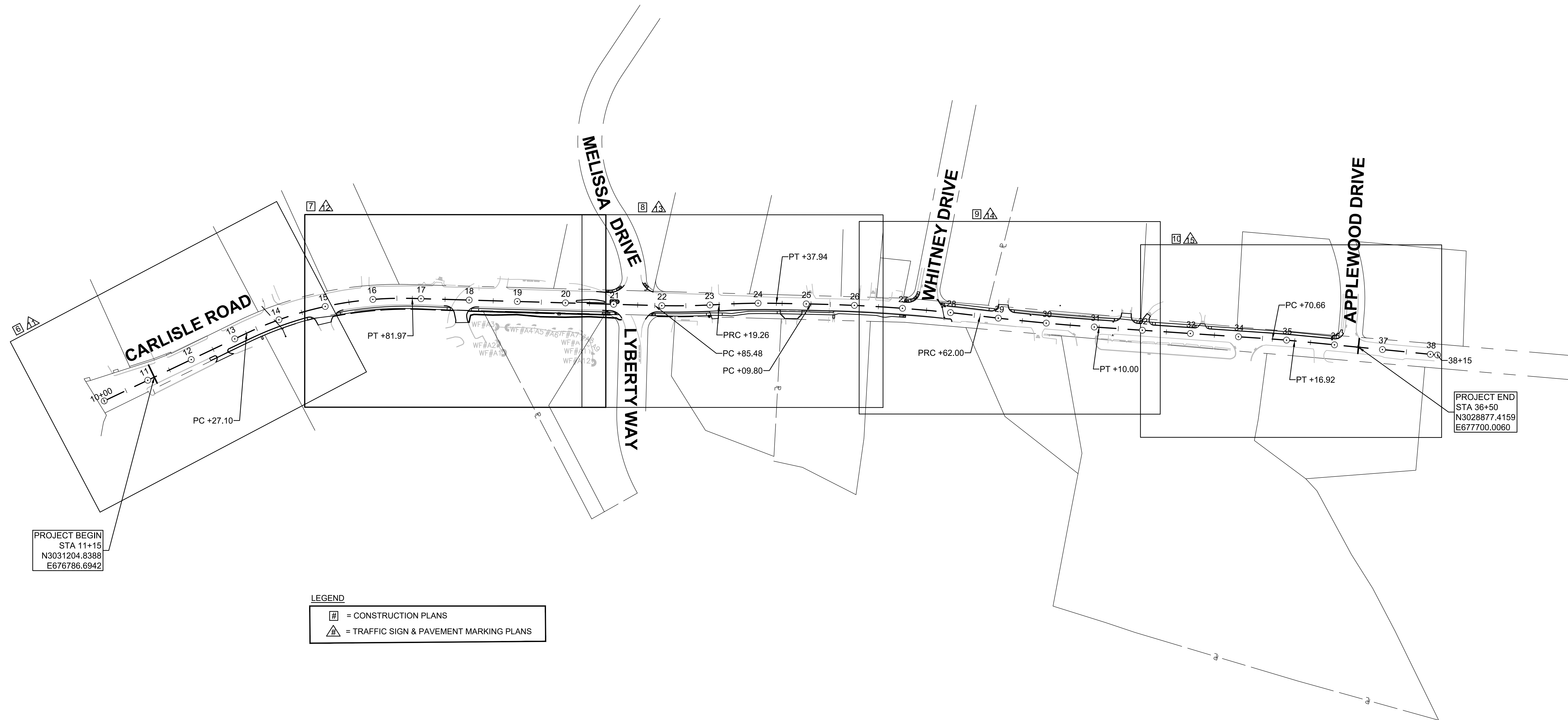
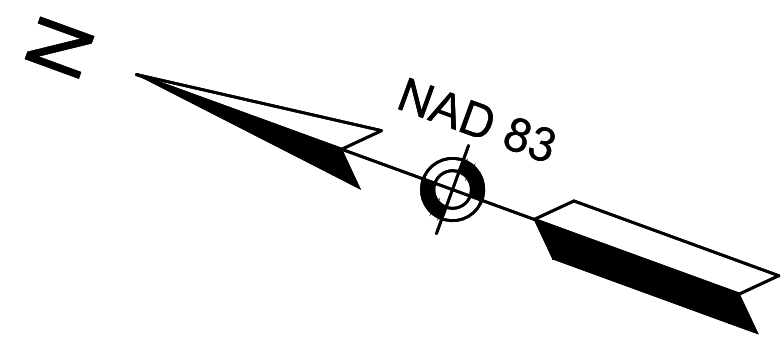
LENGTH OF PROJECT = 2,535 FEET = 0.480 MILES

WESTFORD
CARLISLE ROAD
TITLE SHEET & INDEX
SHEET 1 OF 40

THE COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES 2021 EDITION, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.

05/21/2021	50% DESIGN	-
DATE	DESCRIPTION	REV #
<div> 146 Dascomb Road Andover, MA 01810 978-794-1792</div> <div>311 Main Street 2nd Floor Worcester, MA 01608 508-868-5104</div> <div>169 Ocean Blvd, Unit 3 PO Box 249 Hampton, NH 03842 603-601-8154</div> <div>www.TheEngineeringCorp.com</div>		
DESIGNED BY JPZ	CHECKED BY JAR	DATE 05/21/2021
DRAWN BY SPL/JPZ	APPROVED BY JAR	PROJECT NO. T0949

GENERAL SYMBOLS			TRAFFIC SYMBOLS			ABBREVIATIONS		WESTFORD CARLISLE ROAD LEGEND & ABBREVIATIONS SHEET 2 OF 40	
EXISTING	PROPOSED	DESCRIPTION	EXISTING	PROPOSED	DESCRIPTION	GENERAL			
 JB	 JB	JERSEY BARRIER			TRAFFIC SIGN (1 POST)	AADT	ANNUAL AVERAGE DAILY TRAFFIC		
 CB	 CB/GI	CATCH BASIN OR GUTTER INLET			TRAFFIC SIGN (2 POST)	ABAN	ABANDON		
 CBCI/GICI	 CBCI/GICI	CATCH BASIN OR GUTTER INLET W/ CURB INLET				ADJ	ADJUST		
 FP	 FP	FLAG POLE				APPROX.	APPROXIMATE		
 GP	 GP	GAS PUMP				A.C.	ASPHALT CONCRETE		
 MB	 MB	MAIL BOX				ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE		
		POST SQUARE				BIT.	BITUMINOUS		
		POST CIRCULAR				BB	BITUMINOUS BERM	ABBREVIATIONS (cont.)	
 WELL	 WELL	WELL				BC	BOTTOM OF CURB		
 EHH	 EHH	ELECTRIC HANDHOLE				BD.	BOUND		
		FENCE GATE POST				BL	BASELINE		
 GG	 GG	GAS GATE				BLDG	BUILDING		
 BHL #	 BHL #	BORING HOLE				BM	BENCHMARK		
 MW #	 MW #	MONITORING WELL				BO	BY OTHERS		
 TP #	 TP #	TEST PIT				BOS	BOTTOM OF SLOPE		
		HYDRANT				BR.	BRIDGE		
		LIGHT POLE				CB	CATCH BASIN		
		COUNTY BOUND				CBCI	CATCH BASIN WITH CURB INLET		
		GPS POINT				CC	CEMENT CONCRETE		
		CABLE MANHOLE				CCM	CEMENT CONCRETE MASONRY		
		DRAINAGE MANHOLE				CEM	CEMENT		
		ELECTRIC MANHOLE				CI	CURB INLET		
		GAS MANHOLE				CIP	CAST IRON PIPE		
		MISC MANHOLE				CLF	CHAIN LINK FENCE		
		SEWER MANHOLE				CL	CENTERLINE		
		TELEPHONE MANHOLE				CMP	CORRUGATED METAL PIPE		
		WATER MANHOLE				CSP	CORRUGATED STEEL PIPE		
 MHB	 MHB	MASSACHUSETTS HIGHWAY BOUND				CO.	COUNTY		
		MONUMENT				CONC	CONCRETE		
		STONE BOUND				CONT	CONTINUOUS		
		TOWN OR CITY BOUND				CONST	CONSTRUCTION		
		TRAVERSE OR TRIANGULATION STATION				CR GR	CROWN GRADE		
		TROLLEY POLE OR GUY POLE				DHV	DESIGN HOURLY VOLUME		
		TRANSMISSION POLE				DI	DROP INLET		
		UTILITY POLE W/ FIREBOX				DIA	DIAMETER		
		UTILITY POLE WITH DOUBLE LIGHT				DIP	DUCTILE IRON PIPE		
		UTILITY POLE W / 1 LIGHT				DW	STEADY DON'T WALK - PORTLAND ORANGE		
		UTILITY POLE				DWP	DETECTABLE WARNING PANEL		
		BUSH				DWY	DRIVEWAY		
		TREE				ELEV (or EL.)	ELEVATION		
		STUMP				EMB	EMBANKMENT		
		SWAMP / MARSH				EOP	EDGE OF PAVEMENT		
		WATER GATE				EXIST (or EX)	EXISTING		
		WATER SHUTOFF/CURB STOP				EXC	EXCAVATION		
		PARKING METER				F&C	FRAME AND COVER		
		OVERHEAD CABLE/WIRE				F&G	FRAME AND GRATE		
		CURBING				FDN.	FOUNDATION		
		CONTOURS (ON-THE-GROUND SURVEY DATA)				FLDSTN	FIELDSTONE		
		CONTOURS (PHOTOGRAMMETRIC DATA)				GAR	GARAGE		
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)				GC	GRANITE CURB		
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)				GD	GROUND		
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)				GG	GAS GATE		
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)				GI	GUTTER INLET		
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)				GIP	GALVANIZED IRON PIPE		
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)				GRAN	GRANITE		
		BALANCED STONE WALL				GRAV	GRAVEL		
		GUARD RAIL - STEEL POSTS				GRD	GUARD		
		GUARD RAIL - WOOD POSTS				HDW	HEADWALL		
		CHAIN LINK OR METAL FENCE				HMA	HOT MIX ASPHALT		
		WOOD FENCE				HOR	HORIZONTAL		
		SEDIMENT CONTROL BARRIER				HYD	HYDRANT		
		TREE LINE				INV	INVERT		
		EDGE OF PAVEMENT				JCT	JUNCTION		
		SAWCUT LINE				L	LENGTH OF CURVE		
		TOP OR BOTTOM OF SLOPE				LB	LEACH BASIN		
		LIMIT OF EDGE OF MICROMILLING AND OVERLAY				LOG	LIMIT OF GRADING		
		BANK OF RIVER OR STREAM				LP	LIGHT POLE		
		BORDER OF WETLAND				L&S	LOAM AND SEED		
		100 FT WETLAND BUFFER				LT	LEFT		
		200 FT RIVERFRONT BUFFER				MAX	MAXIMUM		
		STATE HIGHWAY LAYOUT				MB	MAILBOX		
		TOWN OR CITY LAYOUT				MH	MANHOLE		
		COUNTY LAYOUT				MHB	MASSACHUSETTS HIGHWAY BOUND		
		RAILROAD SIDELINE				MIN	MINIMUM		
		TOWN OR CITY BOUNDARY LINE				NIC	NOT IN CONTRACT		
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE				NO.	NUMBER		
		EASEMENT				PC	POINT OF CURVATURE		
						PCC	POINT OF COMPOUND CURVATURE		
						PERM	PERMANENT		
						P.G.L.	PROFILE GRADE LINE		
						PI	POINT OF INTERSECTION		
						POC	POINT ON CURVE		
						POT	POINT ON TANGENT		
						PRC	POINT OF REVERSE CURVATURE		
						PROJ	PROJECT		
						PROP	PROPOSED		
						PSB	PLANTABLE SOIL BORROW		

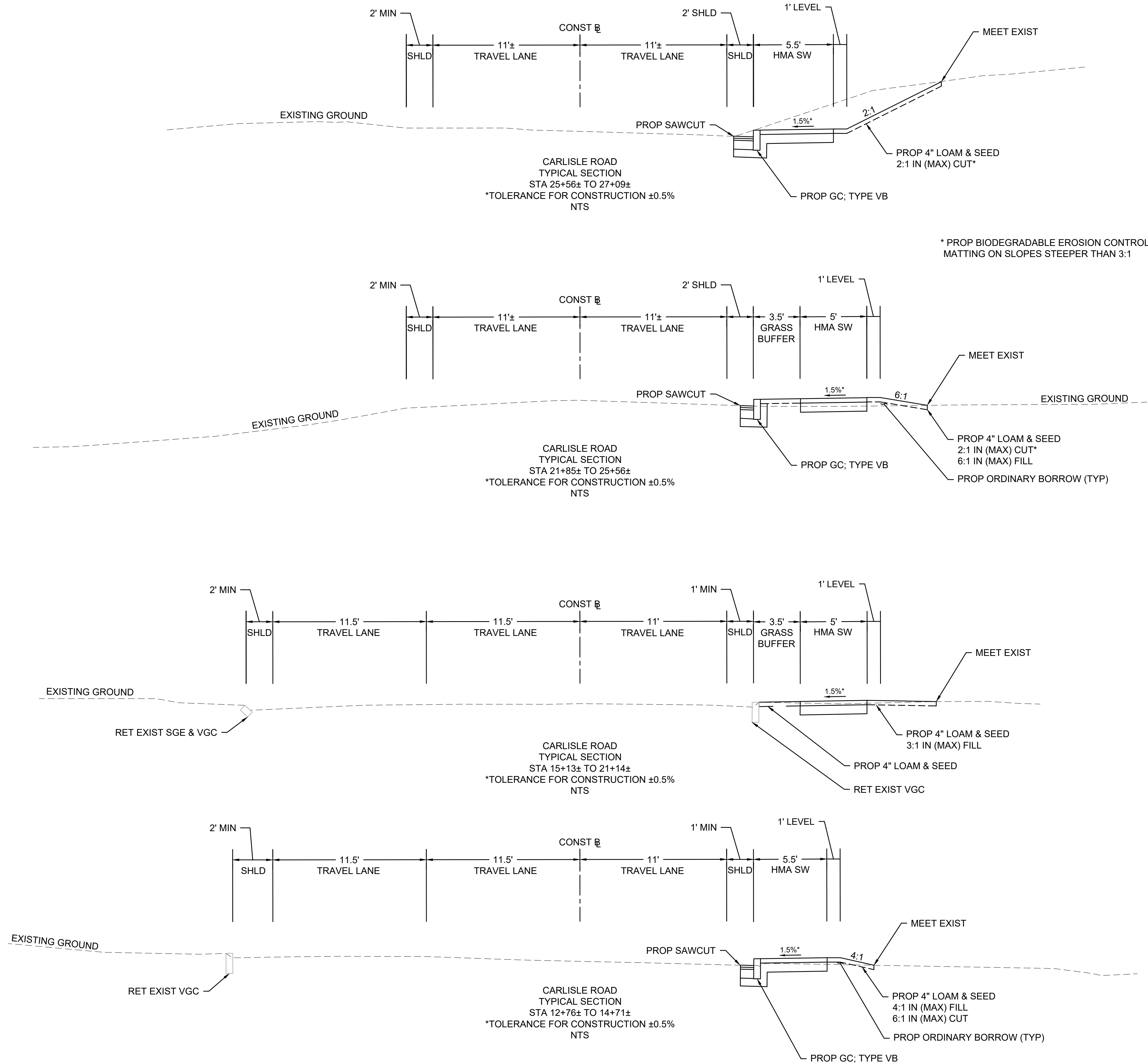


PROJECT BEGIN
STA 11+15
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E676786.6942

LEGEND
= CONSTRUCTION PLANS
= TRAFFIC SIGN & PAVEMENT MARKING PLANS

PROJECT END
STA 36+50
N3028877.4159
E677700.0060

0 100 200 300 400
SCALE: 1" = 100'



PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT LESS THAN 4' WIDE

SURFACE: 1½" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER
2¼" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) OVER

BASE: 6" HIGH EARLY STRENGTH CEMENT CONCRETE OVER

SUBBASE: 8" GRAVEL BORROW, TYPE b

PROPOSED CEMENT CONCRETE CURB RAMPS

SURFACE: 4" CEMENT CONCRETE (AIR ENTRAINED, 4000 PSI, ¾", 610)

BASE: 8" GRAVEL BORROW, TYPE b

PROPOSED HMA SIDEWALK

SURFACE: 1½" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5) OVER
1½" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5) OVER

BASE: 8" GRAVEL BORROW, TYPE b

PROPOSED HMA DRIVEWAY (RESIDENTIAL)

SURFACE: 1½" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5) OVER
2½" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5) OVER

BASE: 8" SUITABLE EXISTING GRAVEL;
ADD GRAVEL BORROW, TYPE b AS REQUIRED

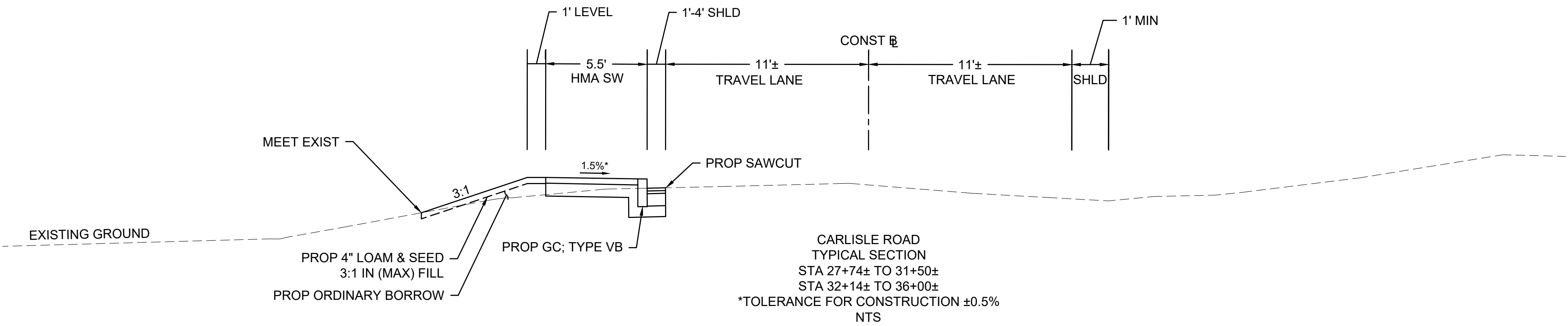
PROPOSED HMA DRIVEWAY (COMMERCIAL)

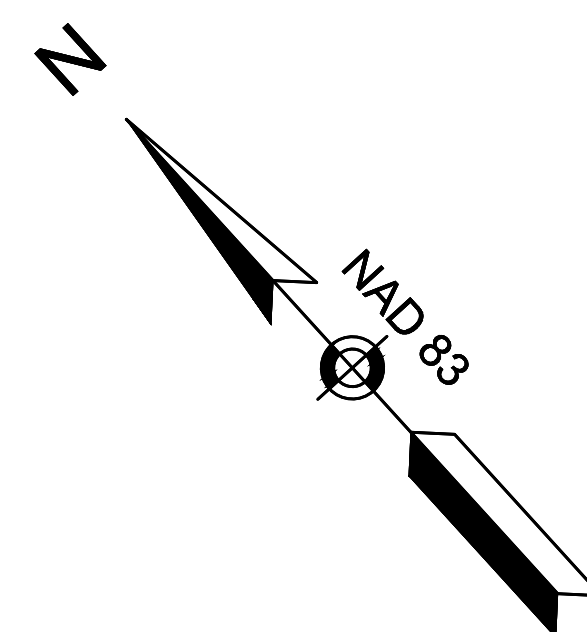
SURFACE: 1½" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER
2½" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5) OVER

BASE: 8" SUITABLE EXISTING GRAVEL;
ADD GRAVEL BORROW, TYPE b AS REQUIRED

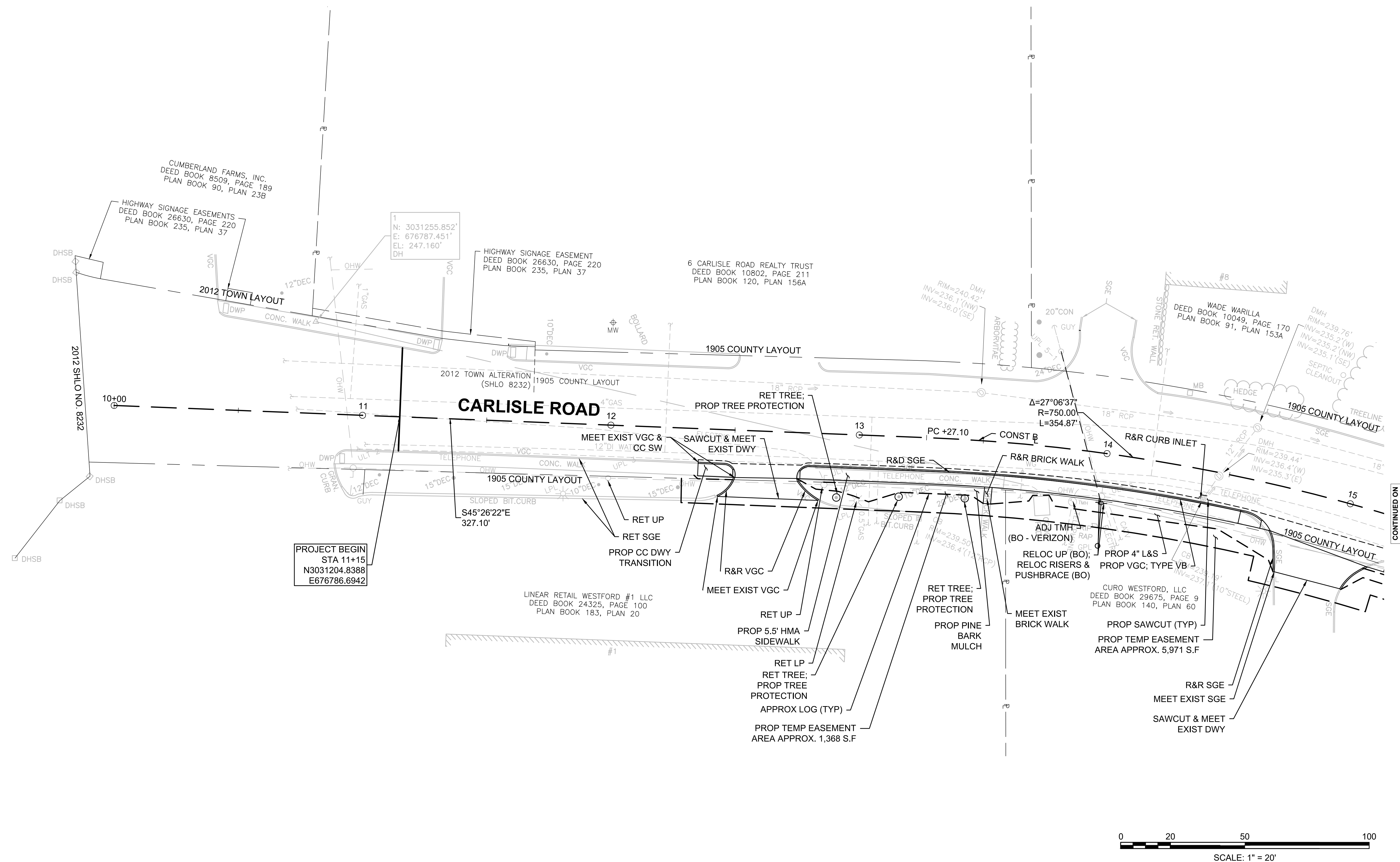
GENERAL PAVEMENT NOTES:

1. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED BETWEEN ALL ASPHALT SURFACES AND SAWCUT JOINTS BEFORE PAVING. HMA JOINT SEALANT SHALL BE APPLIED TO ALL COLD JOINTS (LONGITUDINAL AND TRANSVERSE) BEFORE PAVING SURFACE COURSE. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED IN ACCORDANCE WITH SUBSECTION 450.43. ALL SURFACES SHALL BE CLEAN OF ALL ORGANICS, DEBRIS, AND SAND PRIOR TO PAVING.
2. ALL HMA SHALL BE IN ACCORDANCE WITH SECTION 460 AND SECTION M3 ASPHALTIC MATERIALS.
3. ASPHALT EMULSION FOR TACK COAT SHALL BE RS-1H TO RESIST TRACKING OF TACK BY HAUL VEHICLES.
4. HMA FOR WALKS AND DRIVEWAYS SHALL BE IN ACCORDANCE WITH SECTION 700.
5. ALL GRAVEL BORROW MEETING SPECIFICATION SHALL BE RETAINED IN PLACE, COMPACTED, AND LEVELED AS REQUIRED.

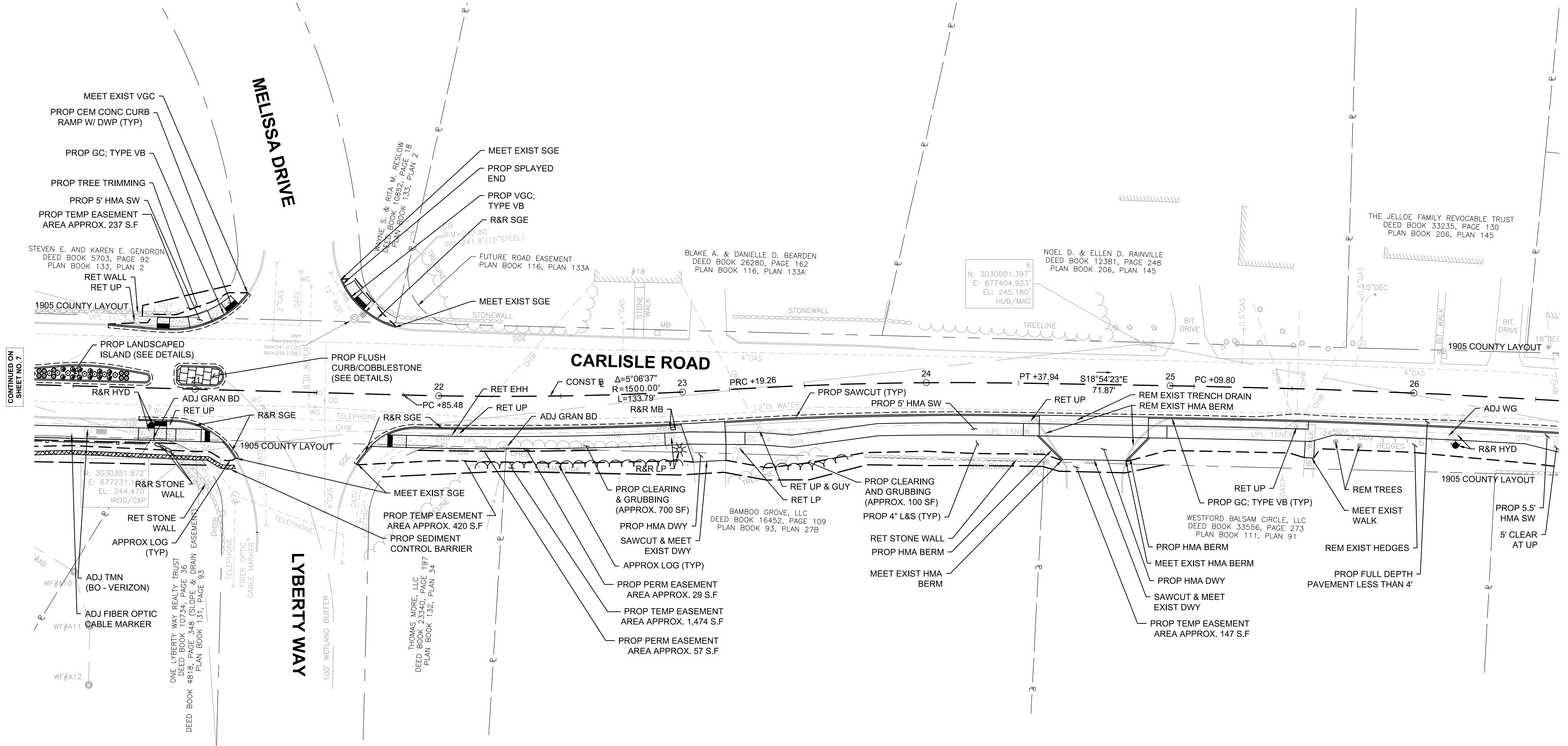
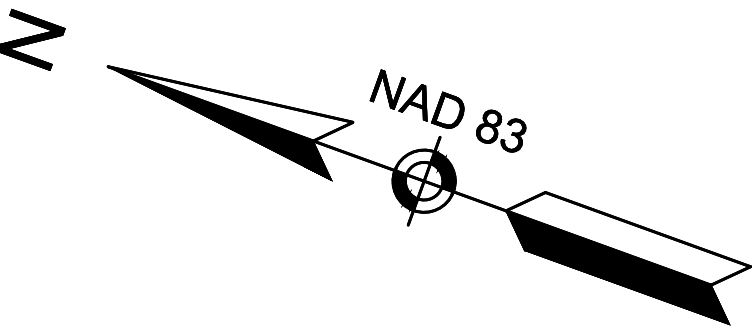




**LITTLETON ROAD
(ROUTE 110)**

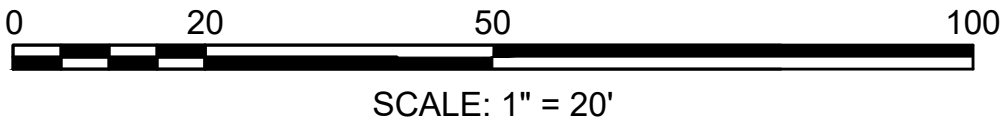


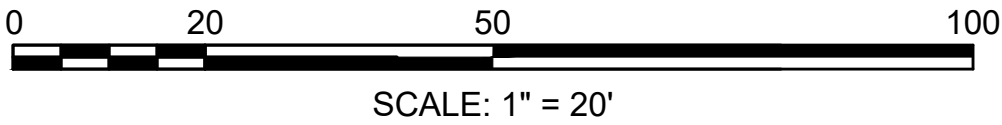
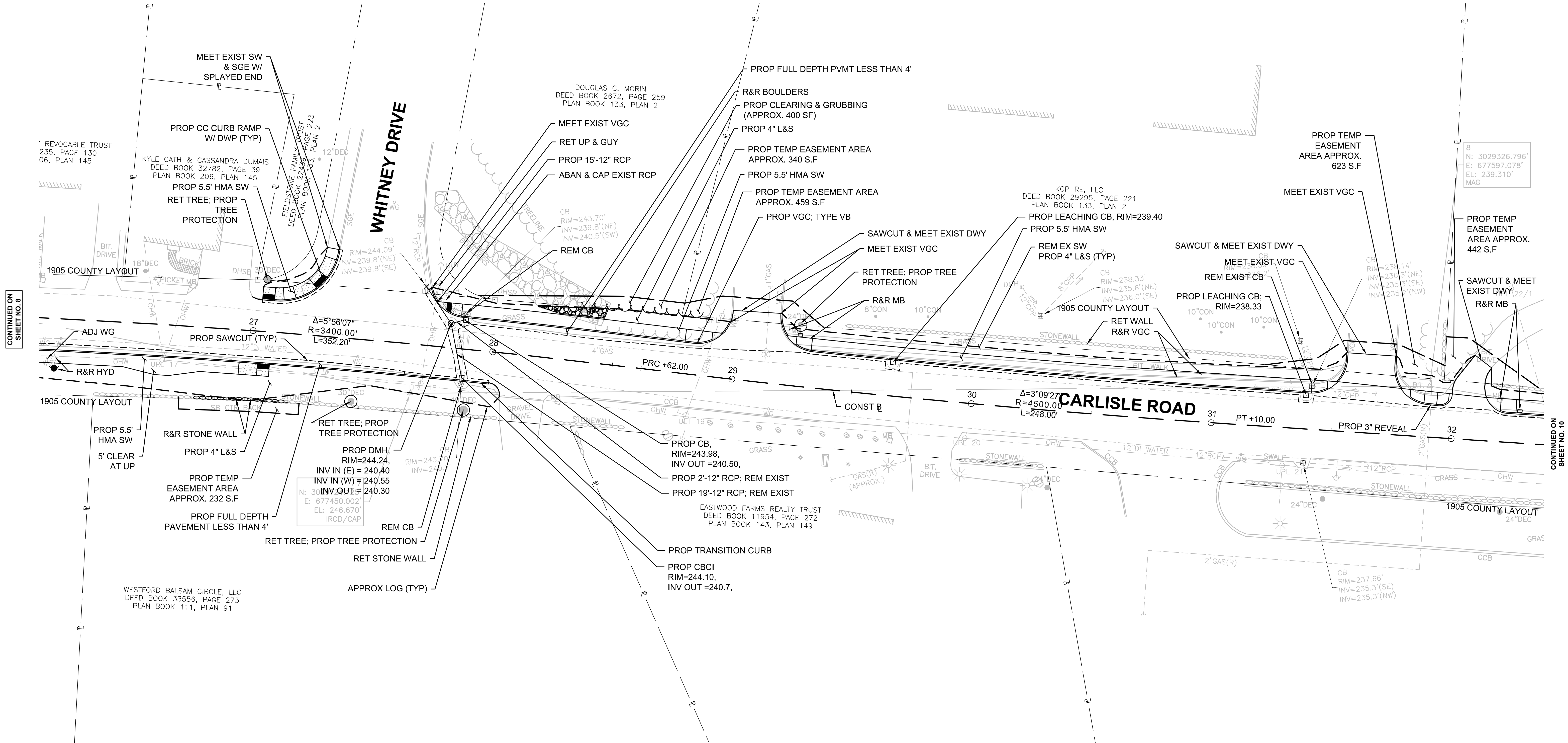
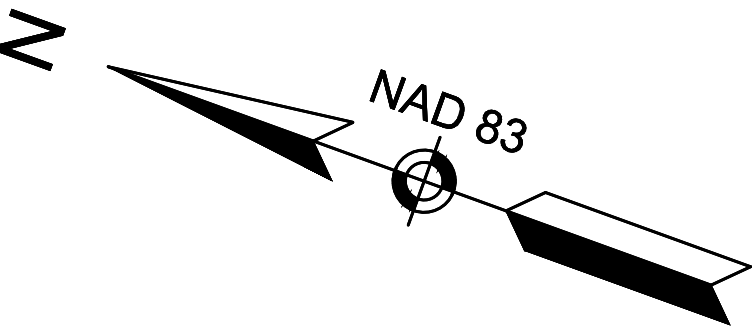




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SHEET NO. 7

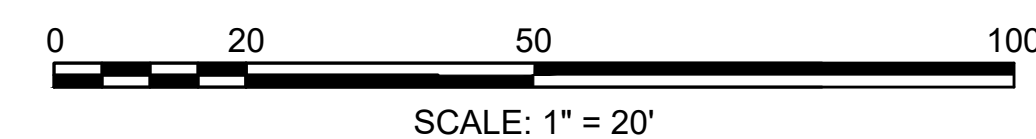
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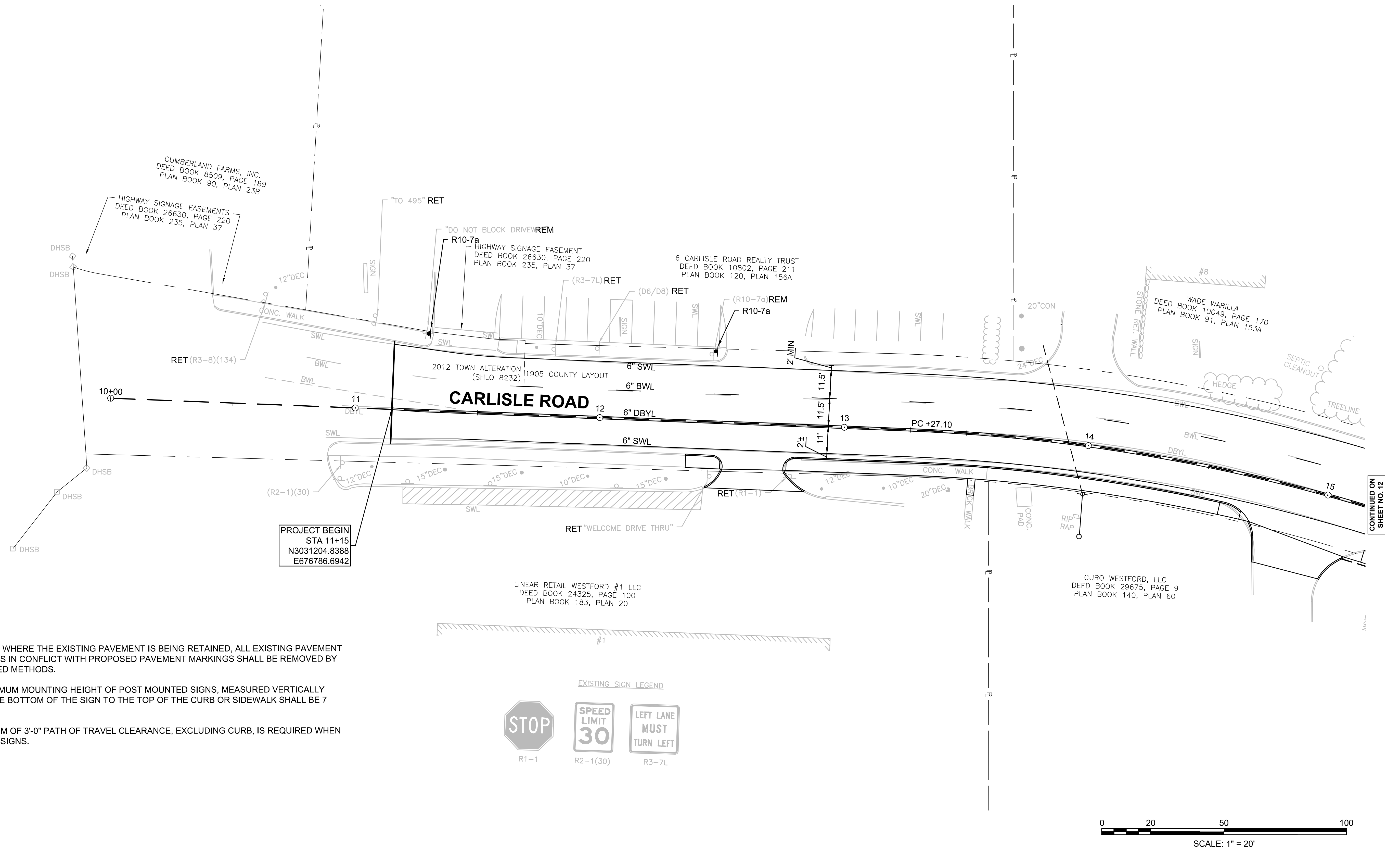


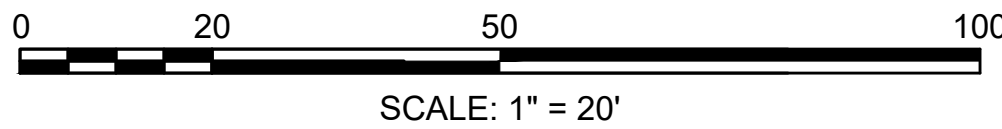
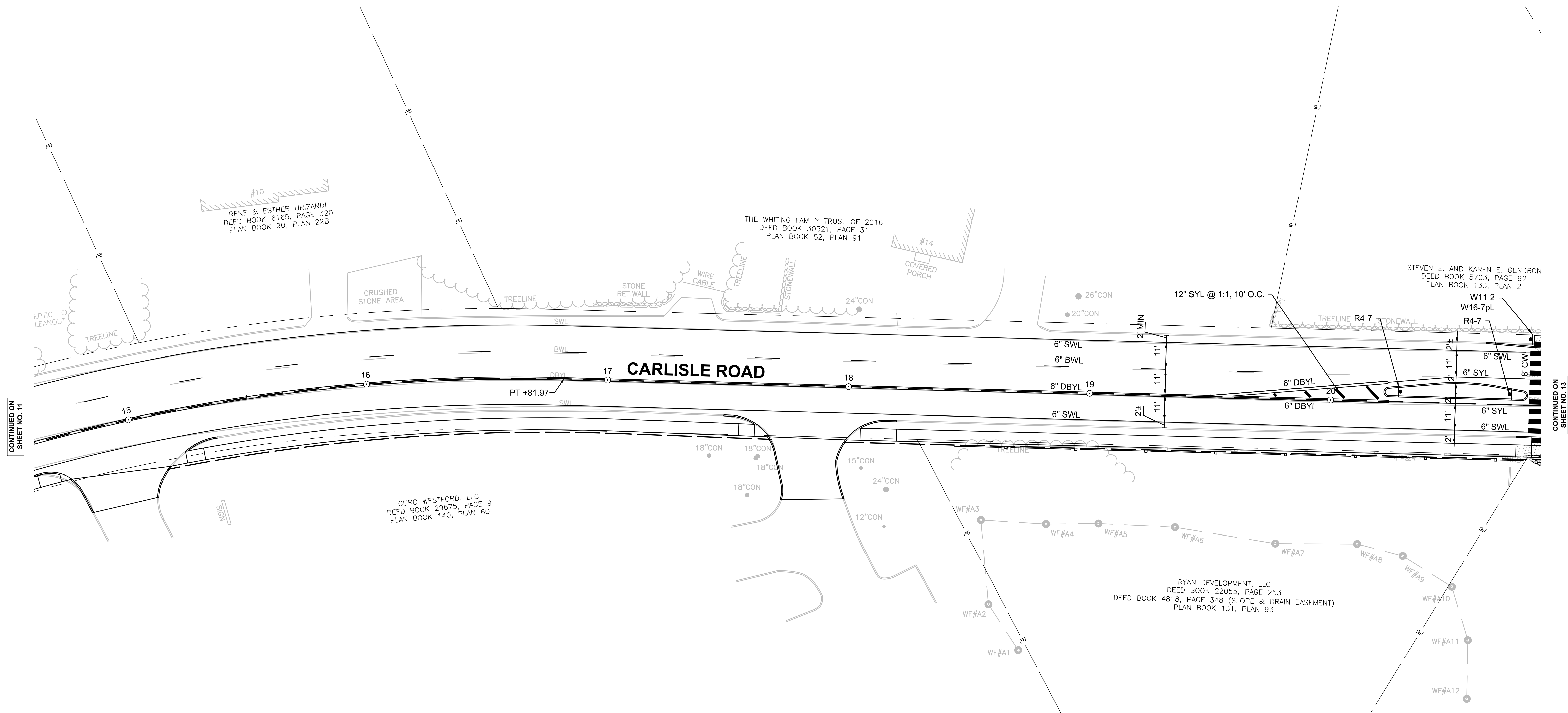
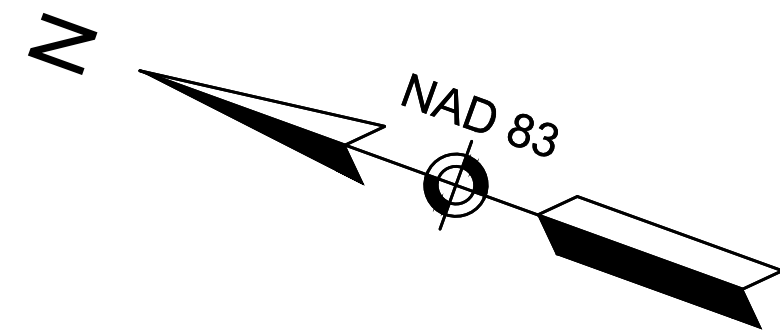


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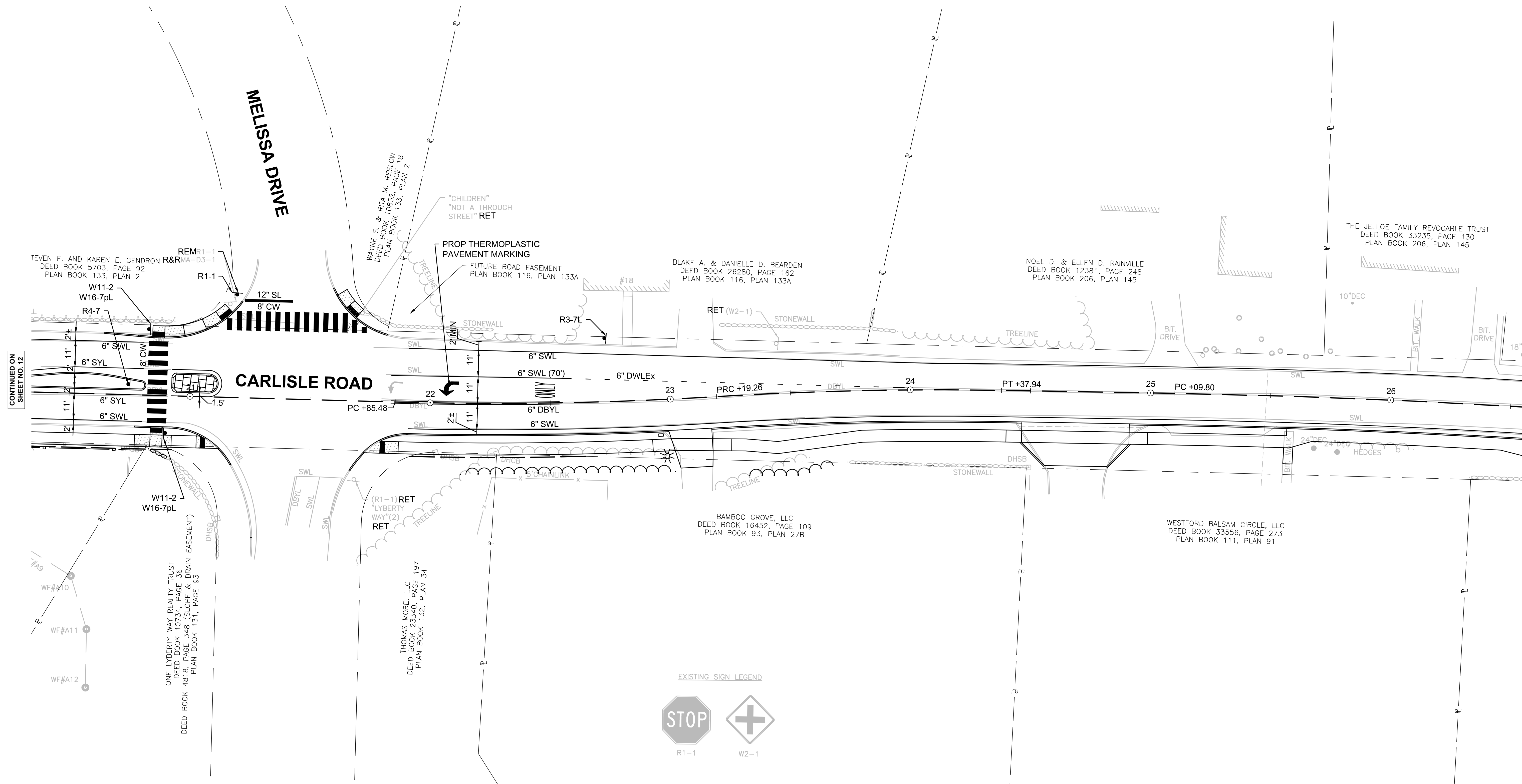
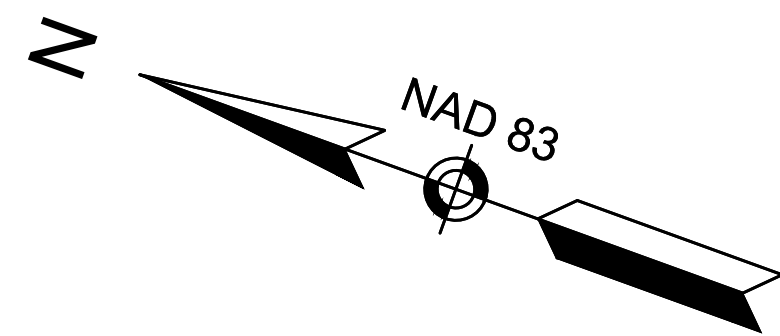






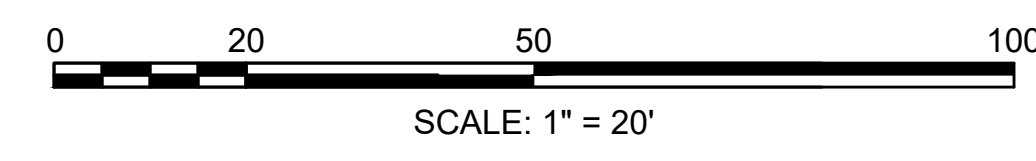
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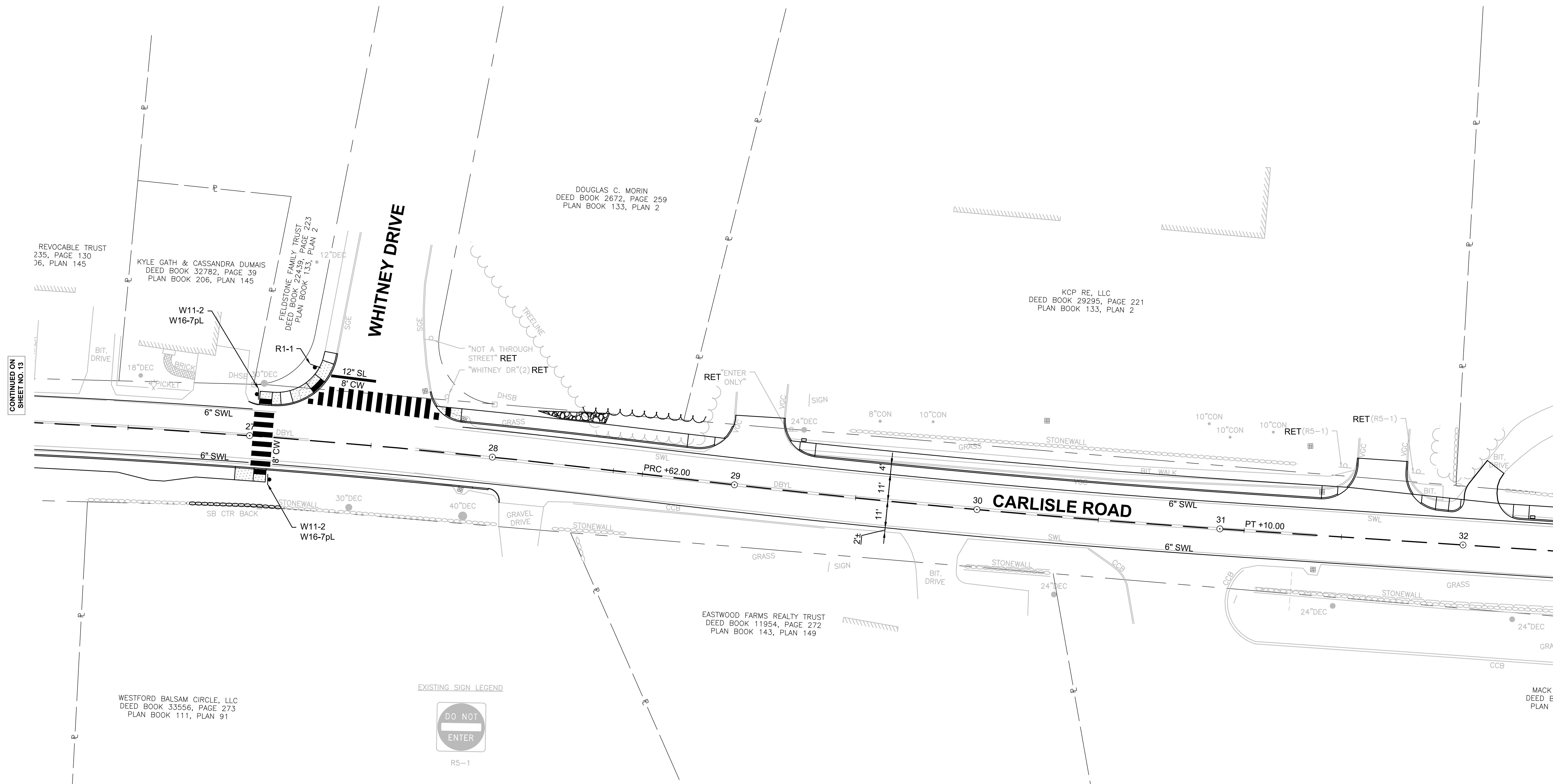
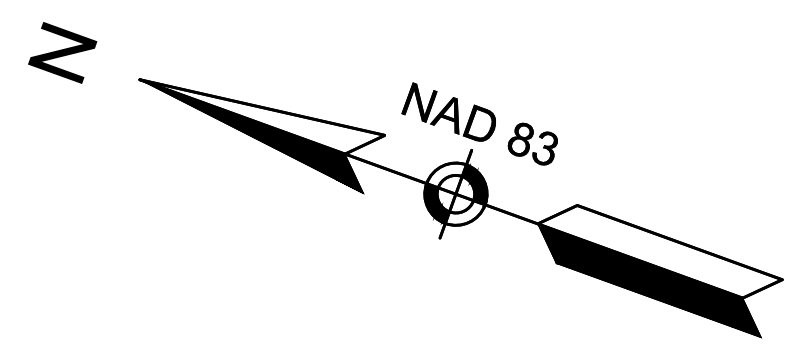
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SHEET NO. 13



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SHEET NO. 12

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SHEET NO. 14

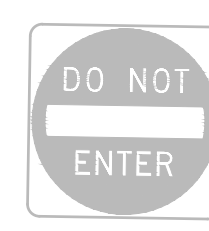




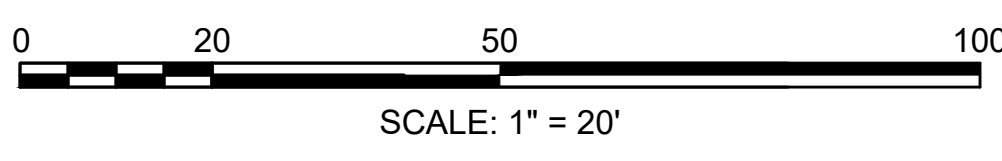
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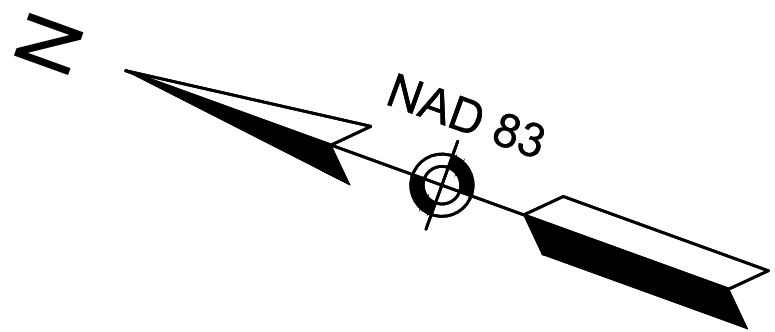
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SHEET NO. 15

EXISTING SIGN LEGEND

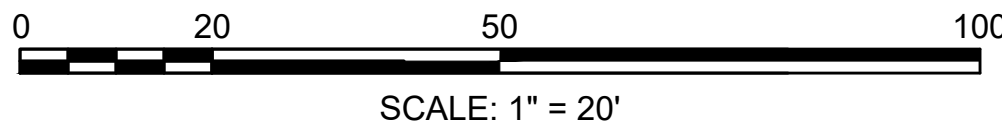
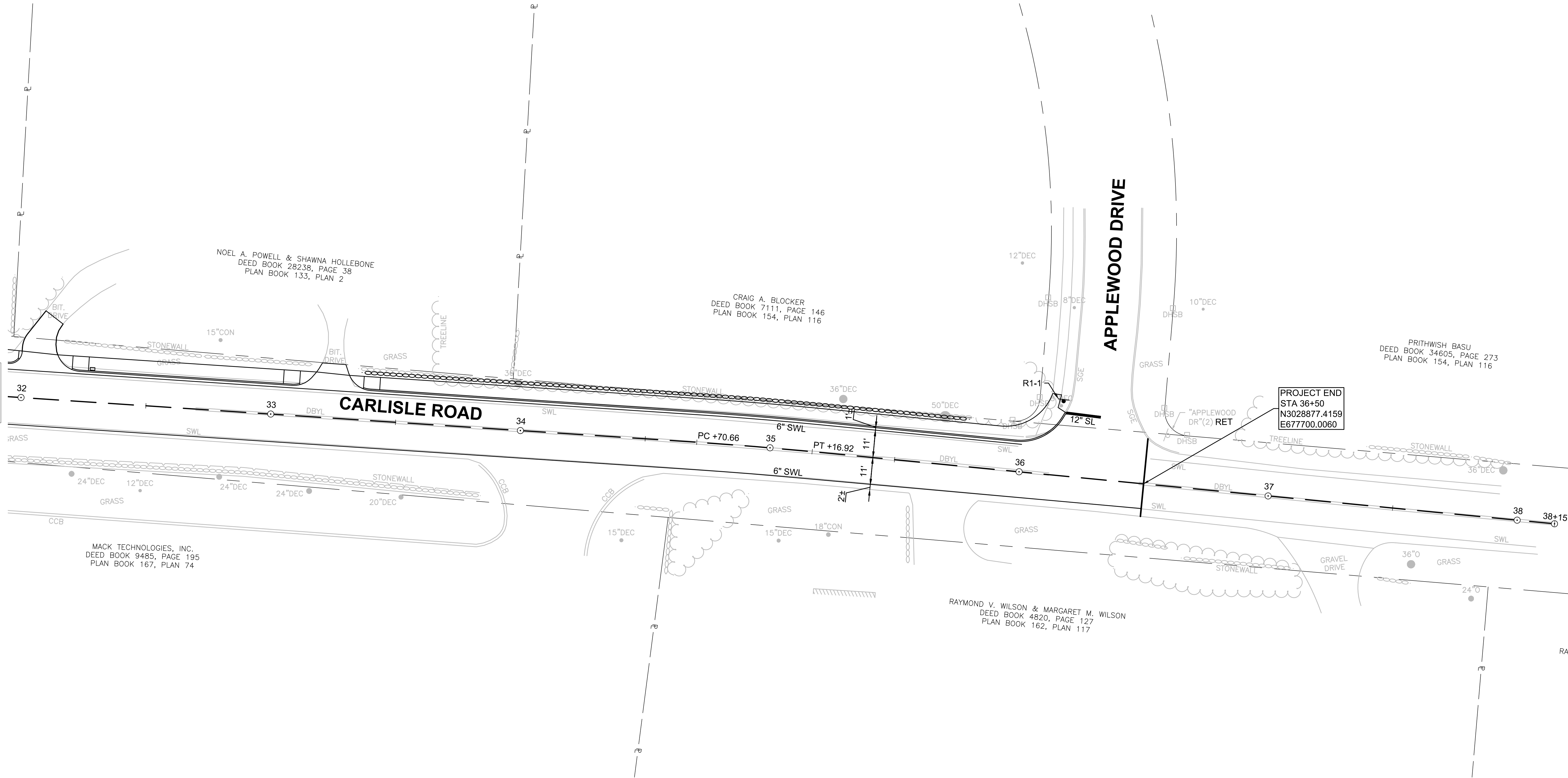








R5-1





CONTINUED ON
SHEET NO. 14



TRAFFIC SIGN SUMMARY														
IDENTIFICATION NUMBER	SIZE OF SIGN (in)			TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			SIZE AND NUMBER OF POSTS REQUIRED	MOUNTING HEIGHT(TO BOTTOM OF SIGN) (FT)	UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT	LEGEND	LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR		BACK- GROUND	LEGEND	BORDER				
R1-1	30	30		①			3	RED	WHITE	WHITE	P-5 2	7	6.25	18.75
R3-7L	30	30					1	WHITE	BLACK	BLACK	P-5 1	7	6.25	6.25
R4-7	24	30					2	WHITE	BLACK	BLACK	P-5 1	7	5.00	10.00
R10-7a	24	30					2	WHITE	BLACK	BLACK	P-5 2	7	5.00	10.00
W11-2	30	30					4	FLUORESCENT YELLOW-GREEN	BLACK	BLACK	P-5 2	7	6.25	25.00
W16-7pL	24	12					4	FLUORESCENT YELLOW-GREEN	BLACK	BLACK	0 MOUNT W/ W11-2	7	2.00	8.00

- NOTES:
- ① SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS FOR TEXT AND LEGEND DIMENSIONS.
 - 2. THE MINIMUM MOUNTING HEIGHT OF POST-MOUNTED SIGNS, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE TOP OF CURB OR SIDEWALK, OR THE ELEVATION OF THE NEAR EDGE OF TRAVEL WAY, SHALL BE 7 FEET UNLESS OTHERWISE SPECIFIED.
 - 3. A MINIMUM OF 3'-0" PATH OF TRAVEL CLEARANCE, EXCLUDING CURB, IS REQUIRED WHEN PLACING SIGNS.

NOTES:

- ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
- ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
- TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
- TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
- SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN THE "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
- CONTRACTORS SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT, AND SIMILAR OPERATIONS.
- THE FIRST TEN PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH SEQUENTIAL FLASHING LIGHTS.
- THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
- DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
- MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
- MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
- ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
- NO LANE CLOSURES SHALL BE PERMITTED DURING PEAK HOUR TRAFFIC. PEAK HOUR IS CONSIDERED TO BE FROM 7–9:00 AM AND 4–6:00 PM ON WEEKDAYS

LEGEND:

- REFLECTORIZED PLASTIC DRUM OR 36" CONE

▨

WORK ZONE

WORK VEHICLE

P/F

POLICE/FLAGGER DETAIL

➔

DIRECTION OF TRAFFIC

TRUCK MOUNTED ATTENUATOR

TYPE III BARRICADE

IMPACT ATTENUATOR

TRAFFIC OR PEDESTRIAN SIGNAL

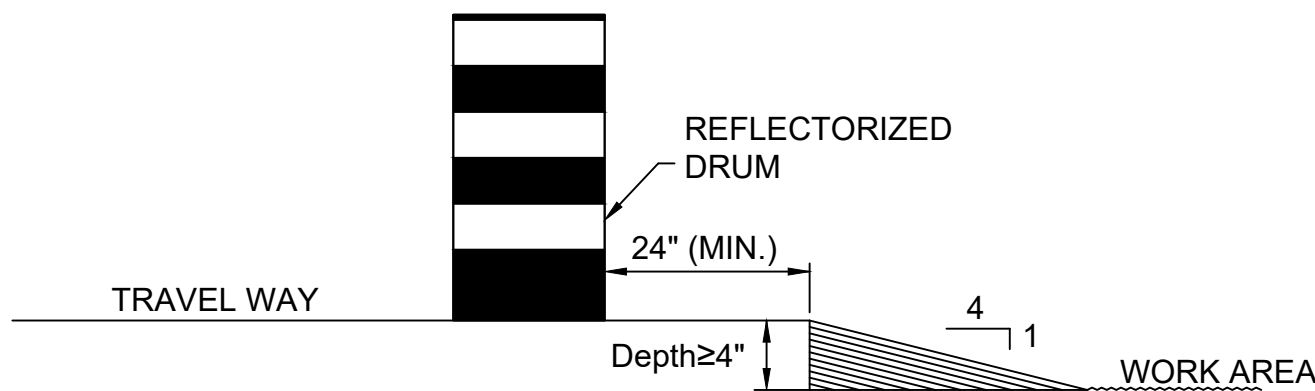
CHANGEABLE MESSAGE SIGN

MEDIAN BARRIER

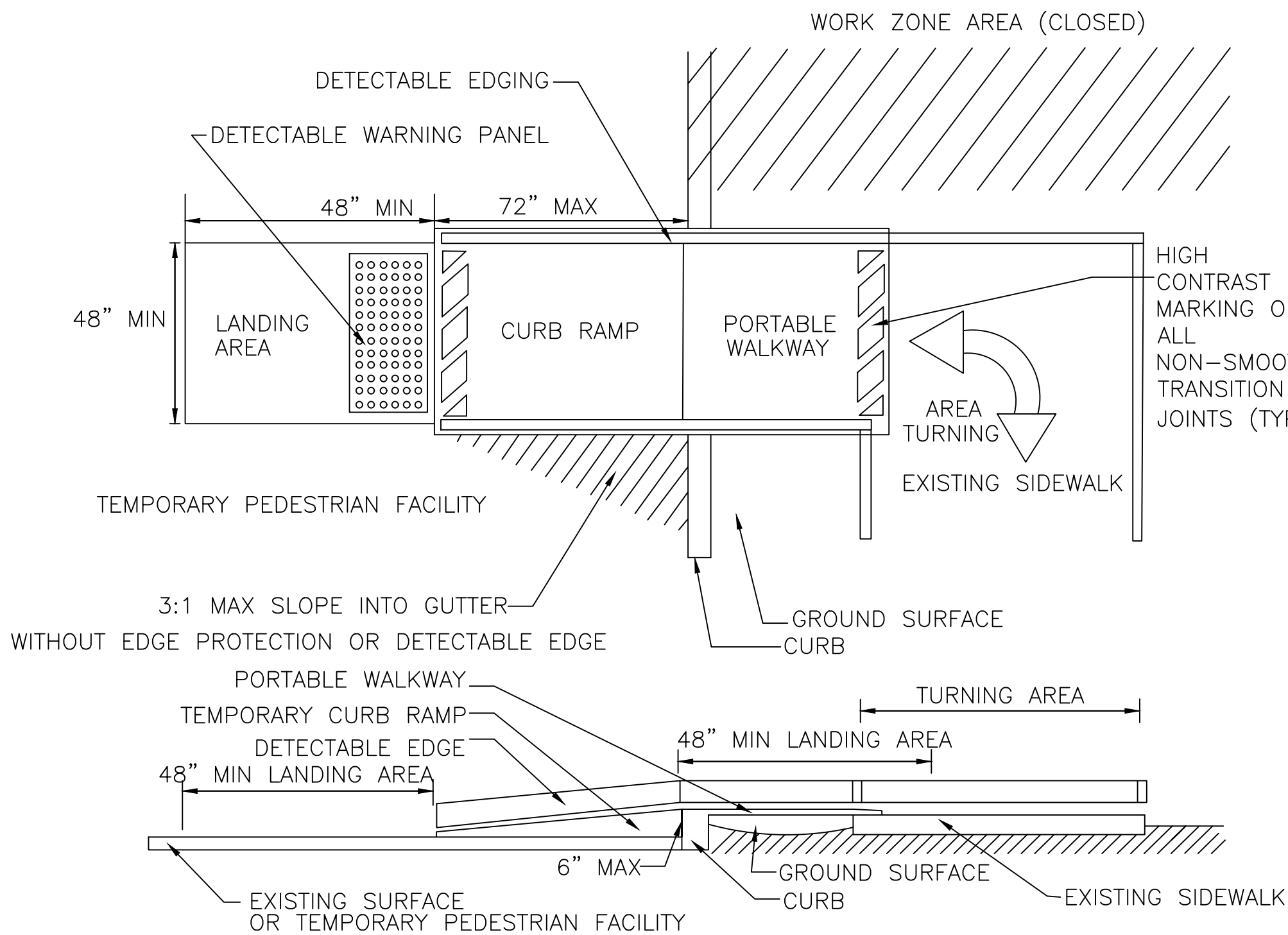
SIGN

ARROW BOARD

MEDIAN BARRIER WITH WARNING LIGHTS



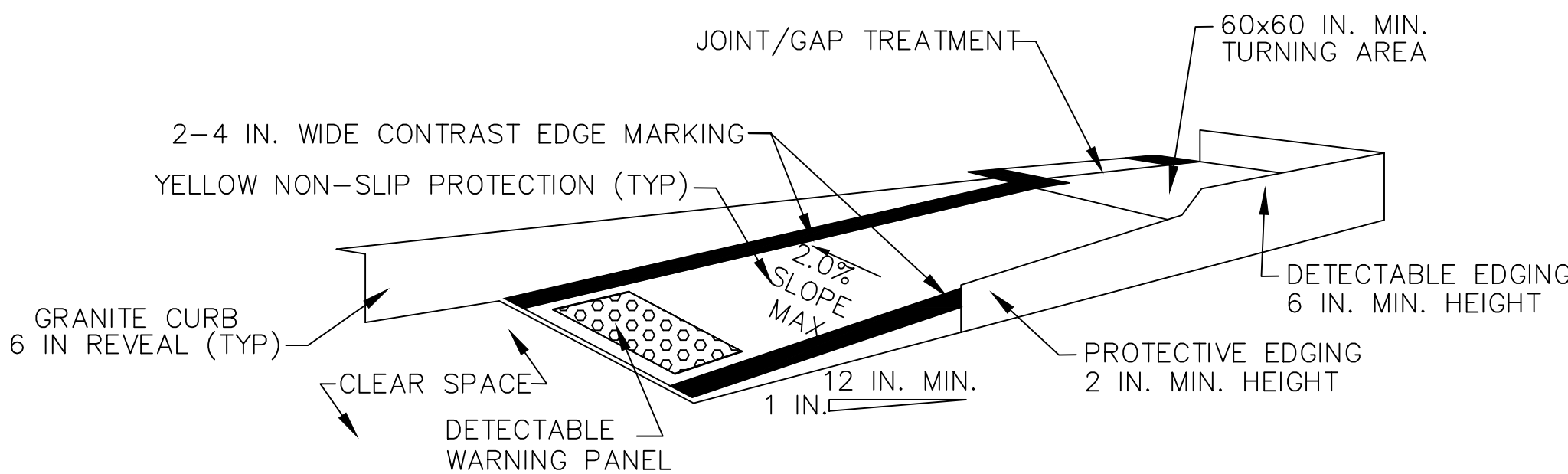
LATERAL DROP-OFF DETAIL
NOT TO SCALE



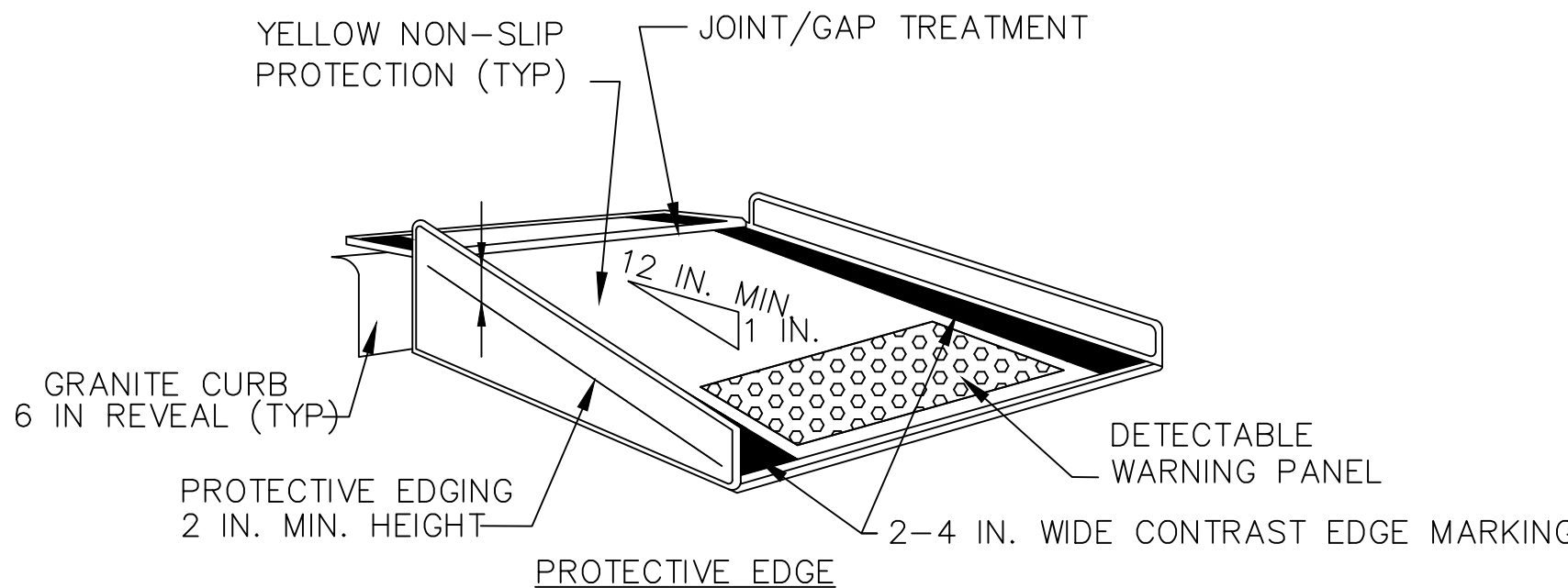
TEMPORARY CURB RAMP-TYPE 2
PEDESTRIAN TYPICAL DETAILS
PEDESTRIAN DETAILS

NOTES:

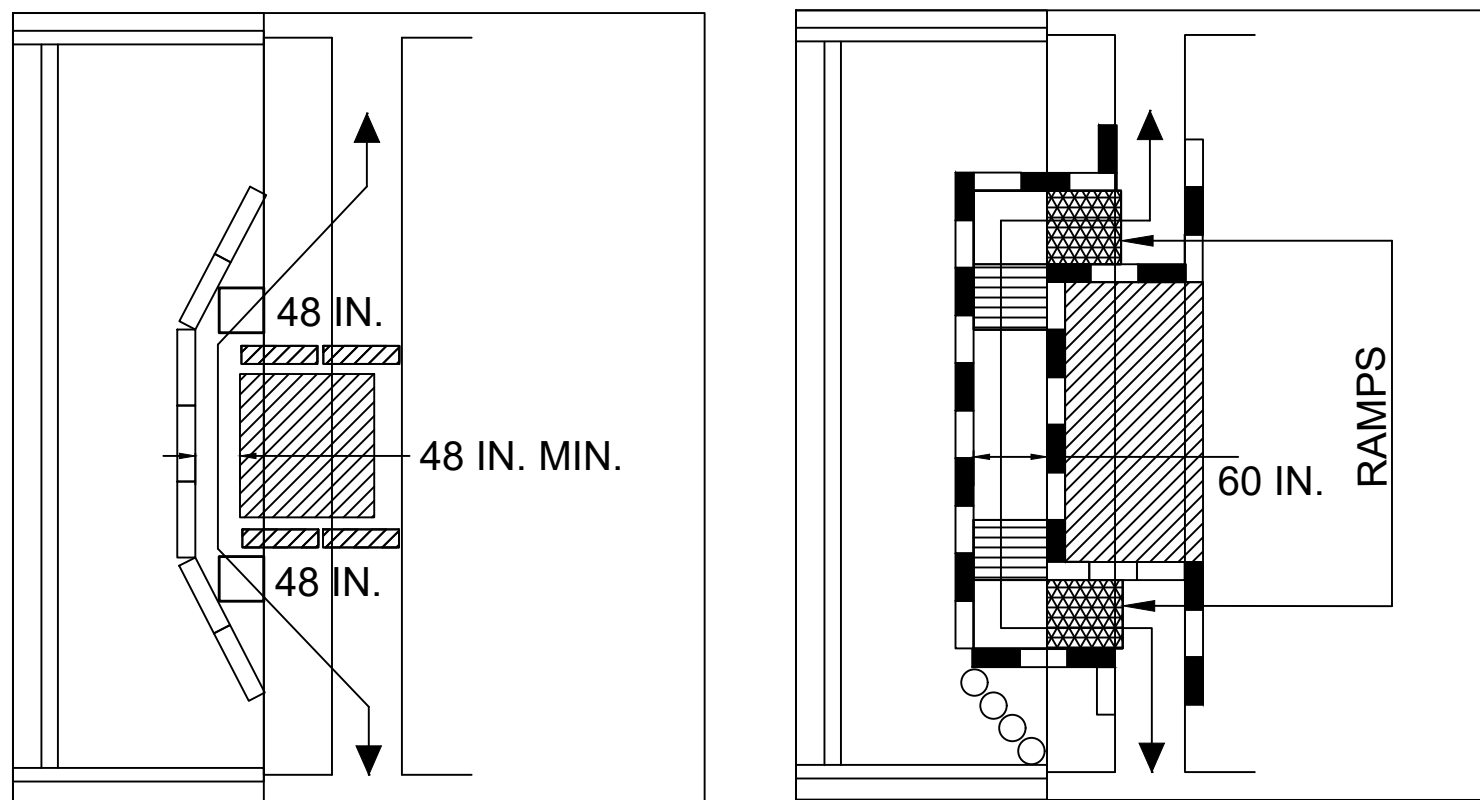
- CURB RAMPS SHALL BE 48 IN. MINIMUM WIDTH WITH A FIRM, STABLE AND NON-SLIP SURFACE.
- PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOP STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
- DETECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
- THE CURB RAMP WALKWAY AND LANDING AREA SURFACE SHALL BE OF A SOLID CONTINUOUS CONTRASTING COLOR ABUTTING UP TO THE EXISTING SIDEWALK.
- CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
- CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
- WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
- LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5 IN. WIDTH.
- CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5 IN. LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25 IN. HIGH, AND BEVELED AT 1:2 BETWEEN 0.25 IN. AND 0.5 IN. HEIGHT.
- IF A TEMPORARY PEDESTRIAN RAMP LEADS TO A CROSSWALK, THEN A DETECTABLE WARNING PAD MUST BE ADHERED TO THE BASE OF THE RAMP. IF IT LEADS TO A PROTECTED PEDESTRIAN BYPASS THAT DOES NOT CONFLICT WITH VEHICULAR TRAFFIC, THEN A PAD SHALL NOT BE INSTALLED ON THE RAMP.



TEMPORARY CURB RAMP-PARALLEL TO CURB



TEMPORARY CURB RAMP-PERPENDICULAR TO CURB



- WHEN EXISTING PEDESTRIAN FACILITIES ARE DISRUPTED, CLOSED, OR RELOCATED IN A TTC ZONE, TEMPORARY FACILITIES SHALL BE PROVIDED AND THEY SHALL BE DETECTABLE AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH THE FEATURES PRESENT IN THE EXISTING PEDESTRIAN FACILITY.
- A PEDESTRIAN CHANNELIZING DEVICE THAT IS DETECTABLE BY A PERSON WITH A VISUAL DISABILITY TRAVELING WITH THE AID OF A LONG CANE SHALL BE PLACED ACROSS THE FULL WIDTH OF THE CLOSED SIDEWALK.
- WHEN USED, TEMPORARY RAMPS SHALL COMPLY WITH AMERICANS WITH DISABILITIES ACT (SEE FIGURES PED-1 & PED-2).
- THE ALTERNATE PATHWAY SHOULD HAVE A SMOOTH CONTINUOUS HARD SURFACE FOR THE ENTIRE LENGTH OF THE TEMPORARY PEDESTRIAN FACILITY.
- THE PROTECTIVE REQUIREMENTS OF A TTC SITUATION HAVE PRIORITY IN DETERMINING THE NEED FOR TEMPORARY TRAFFIC BARRIERS AND THEIR USE IN THIS SITUATION SHOULD BE BASED ON ENGINEERING JUDGMENT.
- AUDIBLE INFORMATION DEVICES SHOULD BE CONSIDERED WHERE MIDBLOCK CLOSINGS AND CHANGED CROSSWALK AREAS CAUSE INADEQUATE COMMUNICATION TO BE PROVIDED TO PEDESTRIANS WHO HAVE VISUAL DISABILITIES.

AUDIBLE DEVICES

FOR LONG TERM SIDEWALK CLOSURES (AT A MINIMUM OVERNIGHT) A FORM OF SPEECH MESSAGING FOR PEDESTRIANS WITH VISUAL DISABILITIES SHALL BE PROVIDED. AUDIBLE INFORMATION DEVICES SUCH AS DETECTABLE BARRIERS OR BARRICADES AND OTHER PASSIVE PEDESTRIAN ACTIVATION (MOTION ACTIVATED) DEVICES SHOULD BE CONSIDERED FOR THESE CASES. THESE AUDIBLE DEVICES CAN BE MOUNTABLE OR STAND ALONE.

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES

TYPE OF TAPER	TAPER LENGTH (L)
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE-LANE, TWO-WAY TRAFFIC TAPER	50 FT MIN. 100 FT MAX.
DOWNSTREAM TAPER	50 FT MIN. 100 FT MAX. PER LANE

FORMULAS FOR DETERMINING TAPER LENGTHS

SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	$L = WS$

WHERE: L = TAPER LENGTH IN FEET

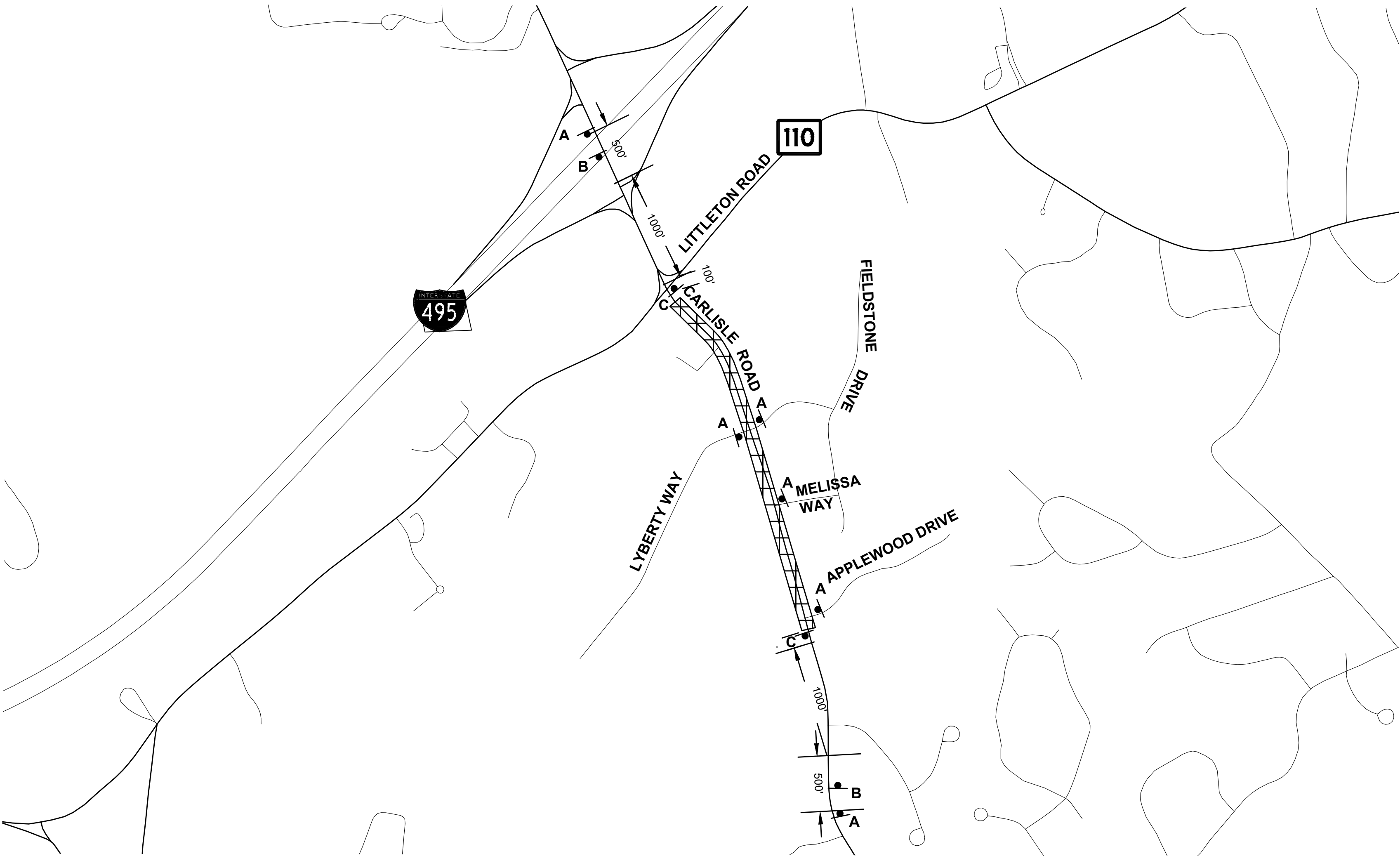
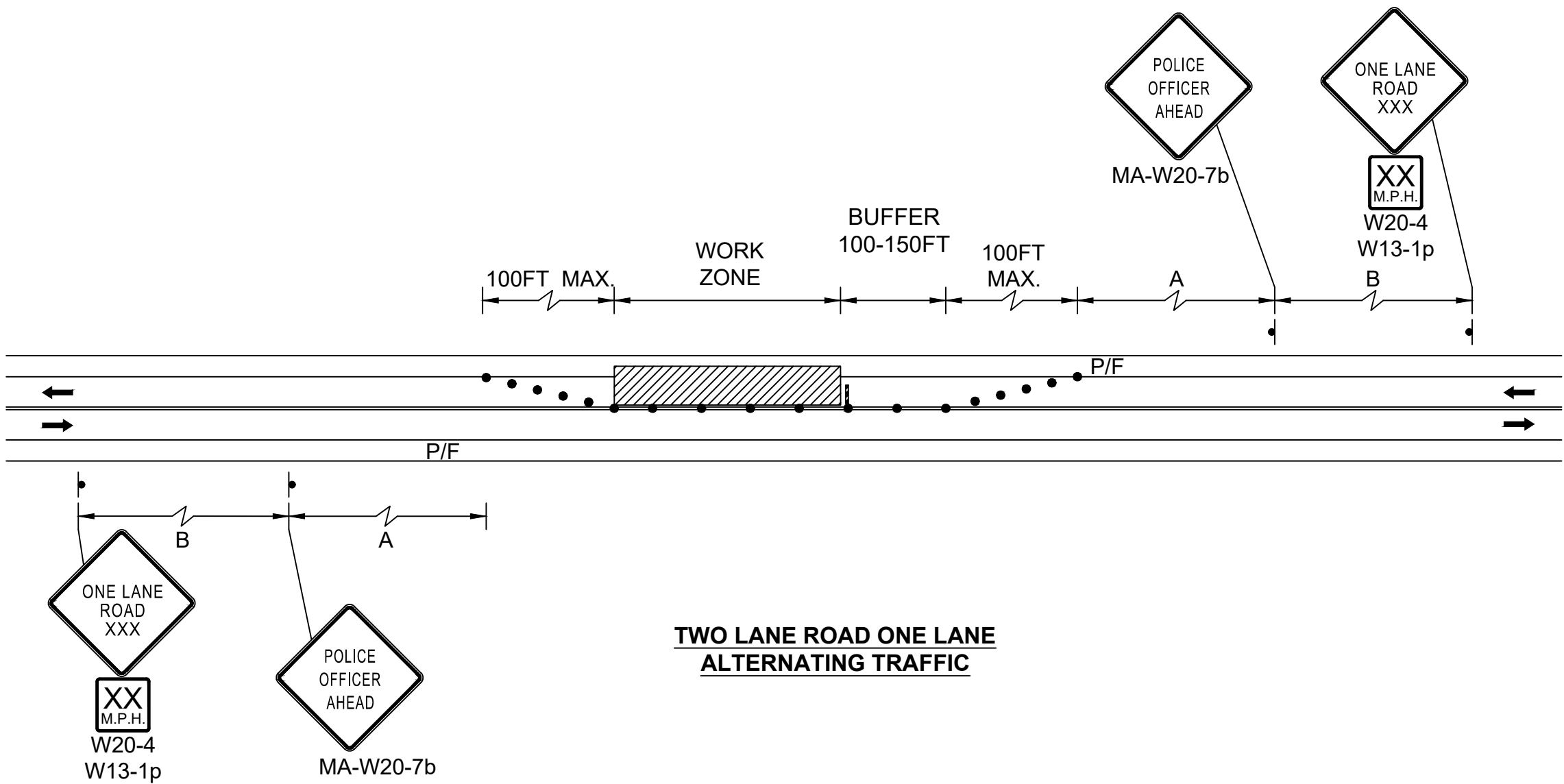
W = WIDTH OF OFFSET IN FEET

S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH

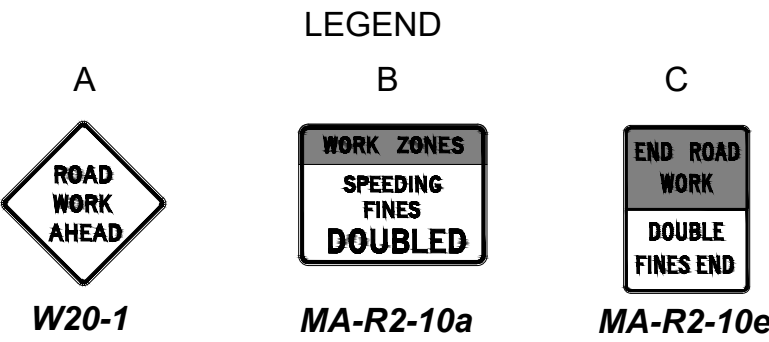
SUGGESTED WORK ZONE WARNING SIGN SPACING

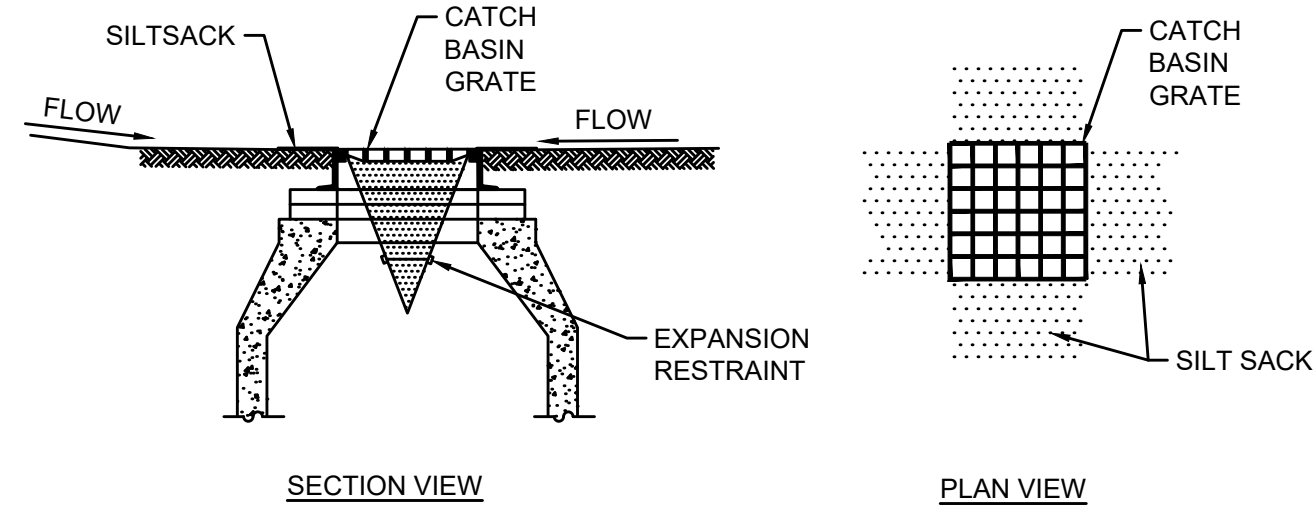
ROAD TYPE	DISTANCE BETWEEN SIGNS (FEET)		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS	350	350	350
MOST OTHER ROADWAYS	500	500	500
FREEWAYS AND EXPRESSWAYS	1,000	1,500	2,640

IDENTIFICATION NUMBER	SIZE OF SIGN (in)		LEGEND	TEXT DIMENSIONS (in)			COLOR			NUMBER OF SIGNS REQUIRED	UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR	BACK-GROUND	LEGEND	BORDER			
MA-R2-10a	48	36		MASSDOT STANDARD SIGN			FL. ORANGE WHITE	BLACK BLACK	BLACK BLACK	2	12.00	24.00
MA-R2-10e	36	48		↓			FL. ORANGE WHITE	BLACK BLACK	BLACK BLACK	2	12.00	24.00
W13-1p	24	24		SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS			FL. ORANGE	BLACK	BLACK	2	4.00	8.00
W20-1	36	36		↓			FL. ORANGE	BLACK	BLACK	4	9.00	36.00
W20-4	36	36		↓			FL. ORANGE	BLACK	BLACK	2	9.00	18.00
MA-W20-7b	36	36		MASSDOT STANDARD SIGN			FL. ORANGE	BLACK	BLACK	2	9.00	18.00



ADVANCE SIGNING SCHEMATIC
N.T.S.

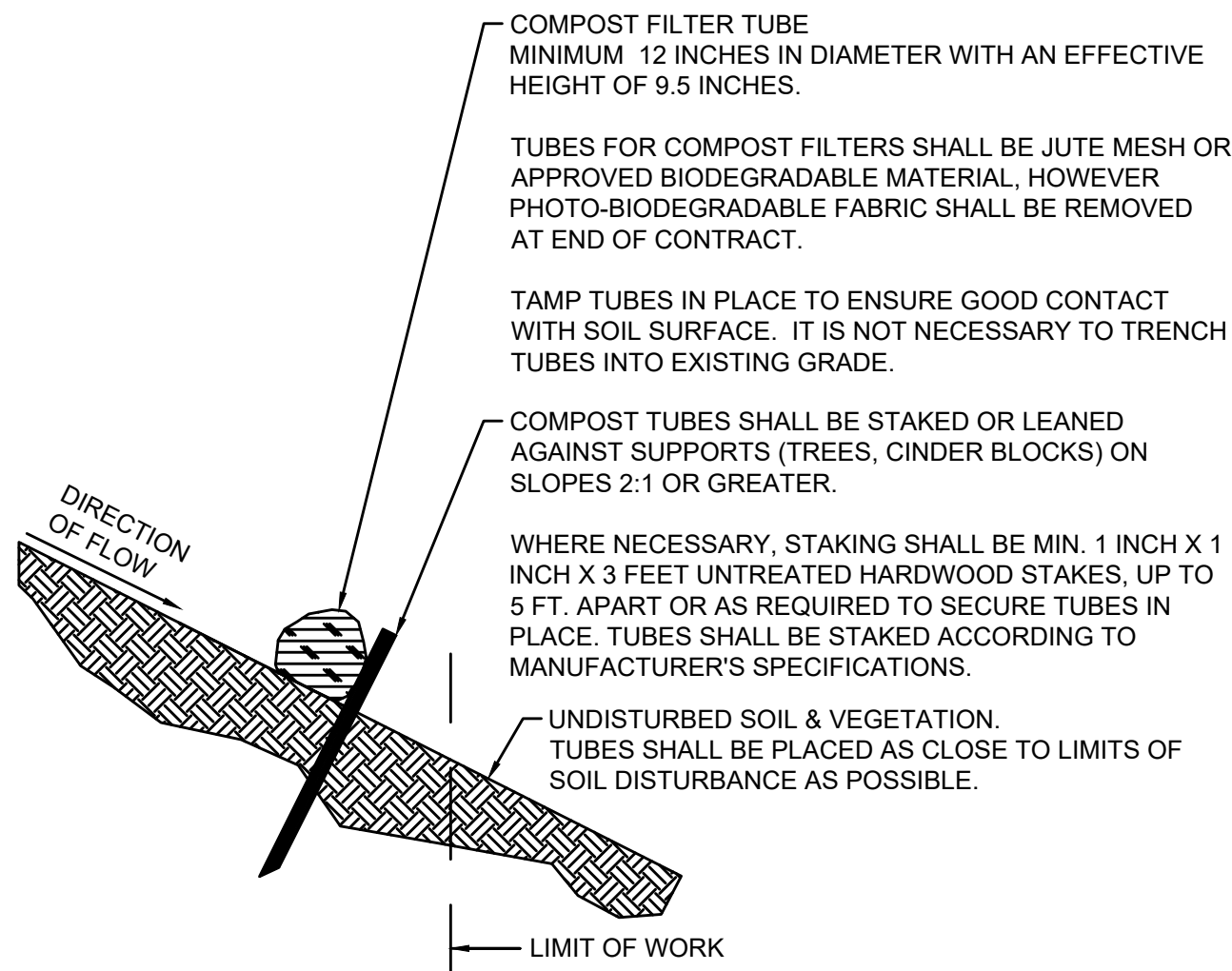




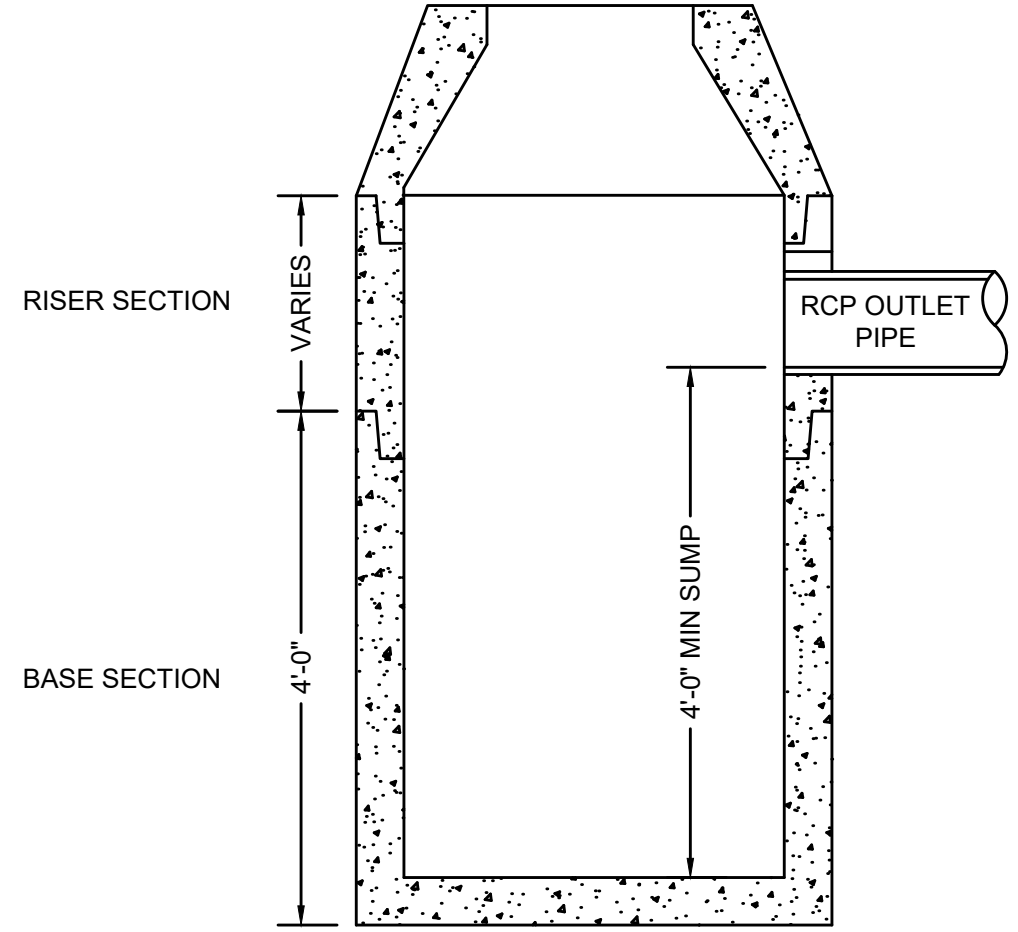
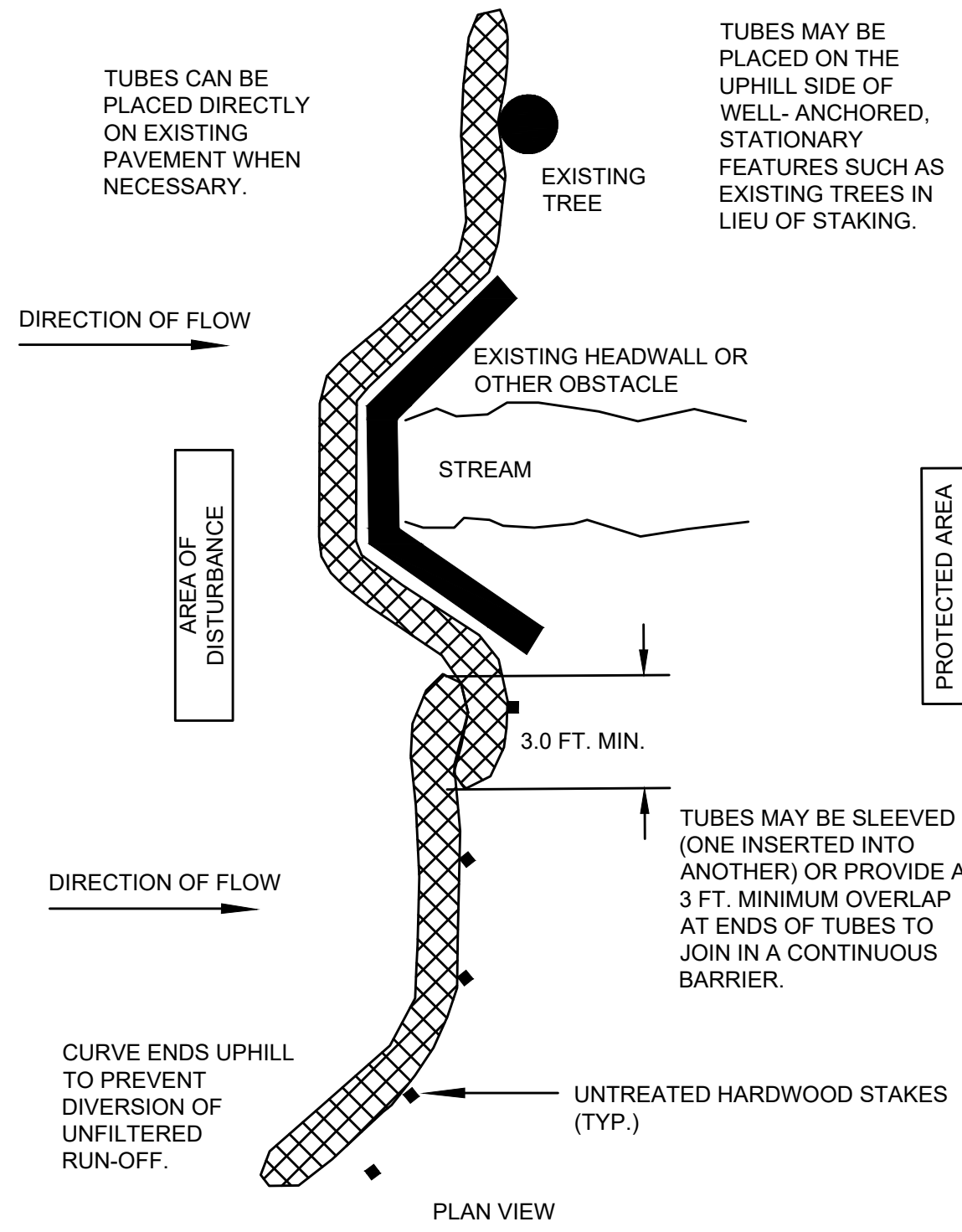
- NOTES:**
1. INSTALL SILT SACK IN EXISTING CATCH BASINS BEFORE COMMENCING WORK, AND IN NEW CATCH BASINS IMMEDIATELY AFTER INSTALLATION OF STRUCTURE. MAINTAIN UNTIL BINDER COURSE PAVING IS COMPLETE OR A PERMANENT STAND OF GRASS HAS BEEN ESTABLISHED.
 2. GRATE TO BE PLACED OVER SILT SACK.
 3. SILT SACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.

INLET PROTECTION SILT SACK IN CATCH BASIN
N.T.S.

- NOTES:**
1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES FOR SLOPES UP TO 50 FEET IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
 2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
 3. TUBE LOCATION MAY BE SHIFTED TO ADJUST TO LANDSCAPE FEATURES, BUT SHALL PROTECT UNDISTURBED AREA AND VEGETATION TO MAXIMUM EXTENT POSSIBLE.
 4. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
 5. ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER.
 6. ADDITIONAL STAKING SHALL BE USED AT THE DIRECTION OF THE ENGINEER.

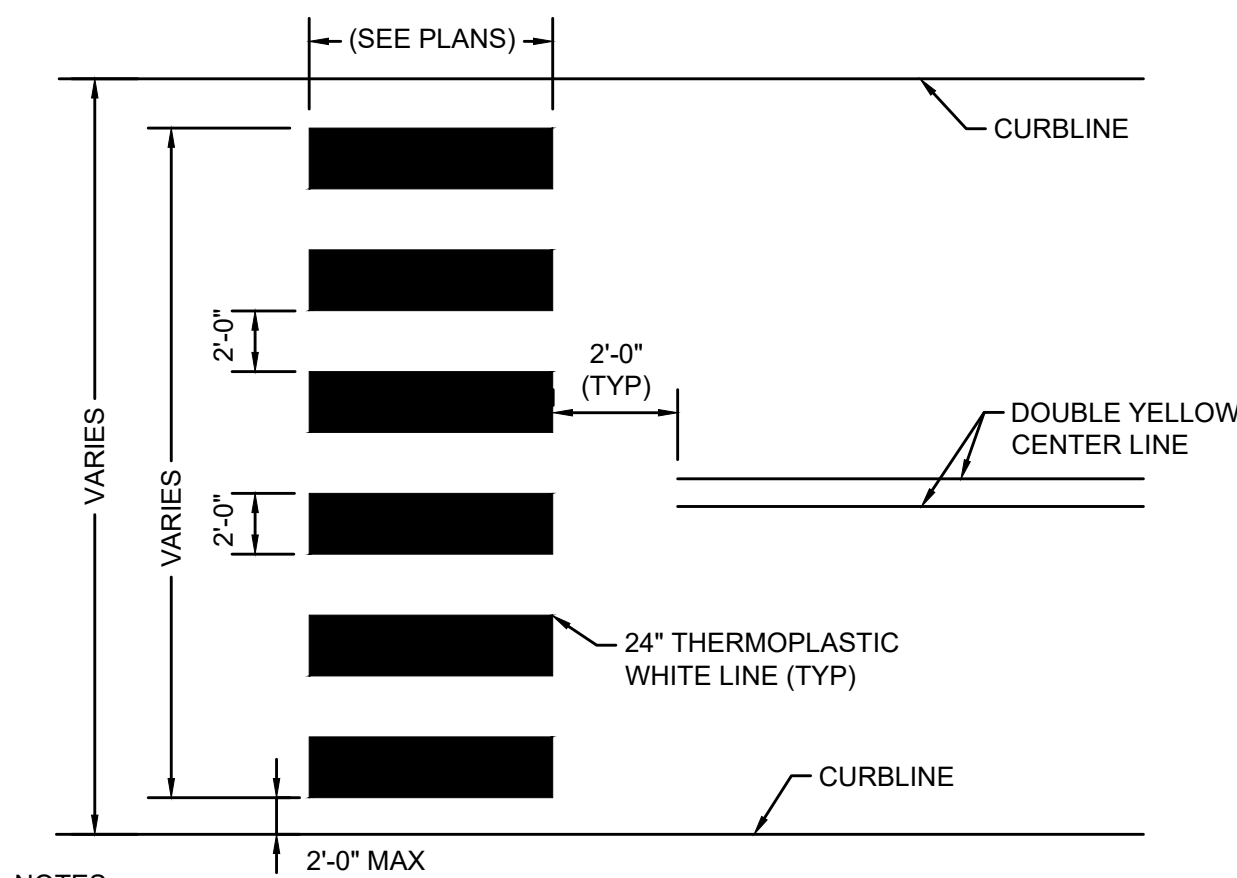


SEDIMENT CONTROL BARRIER
N.T.S.



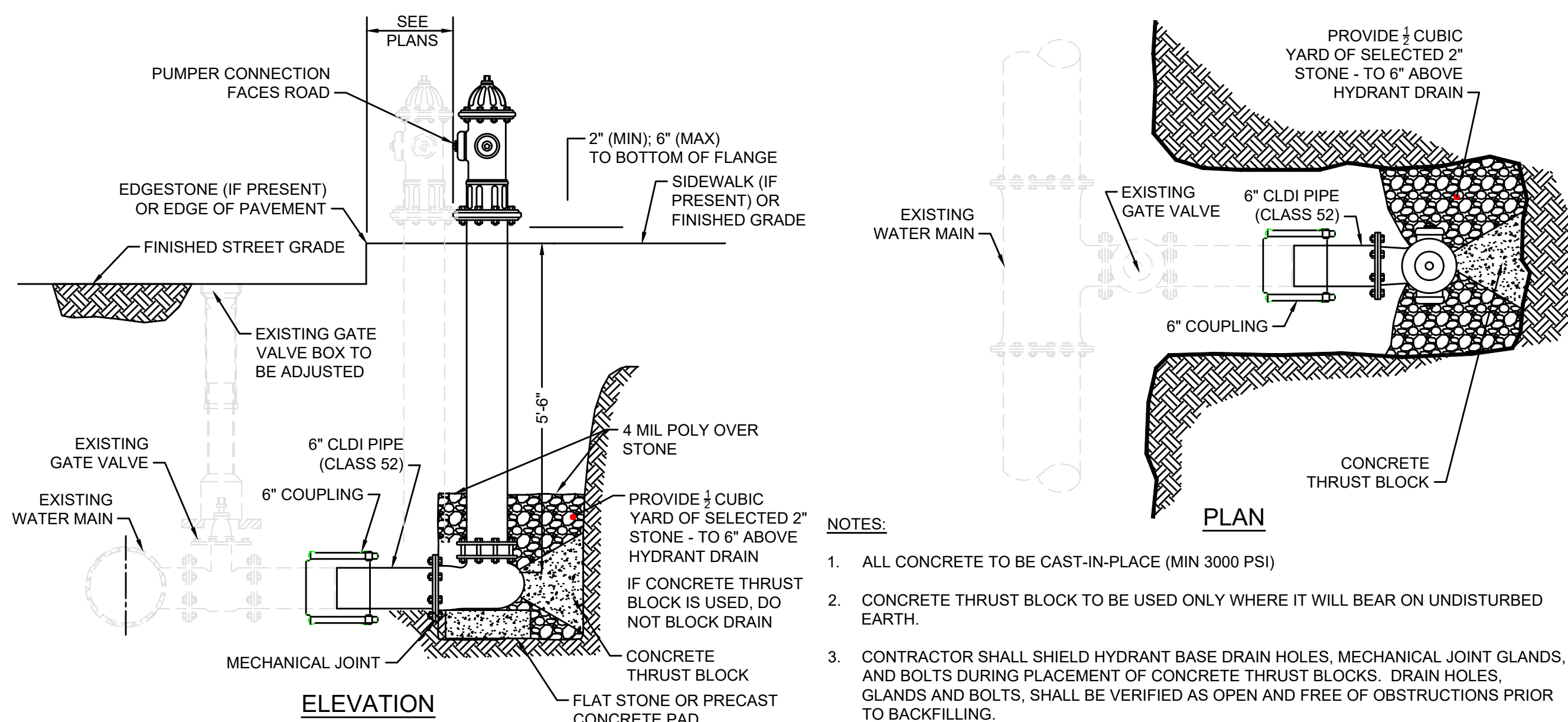
- NOTE:**
- ALL CATCH BASINS SHALL CONFORM TO MASSDOT CONSTRUCTION STANDARD E 201.4.0 EXCEPT FOR 4' SUMP DEPTH AS SHOWN

DEEP SUMP CATCH BASIN
N.T.S.



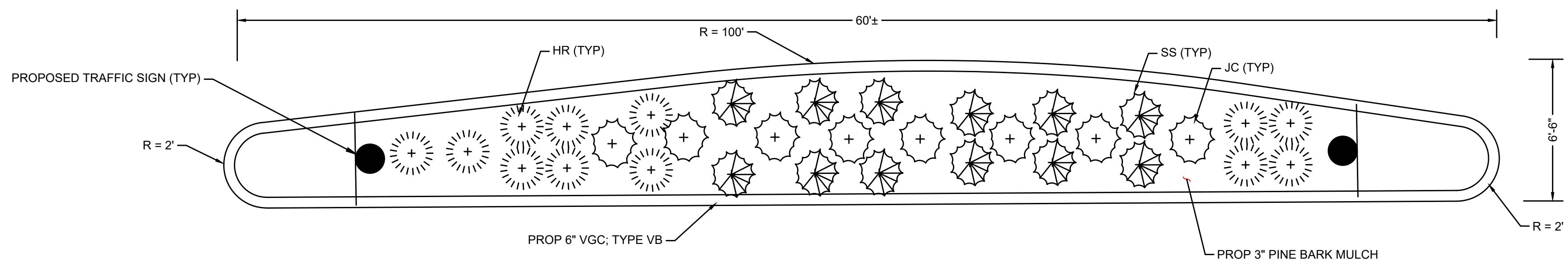
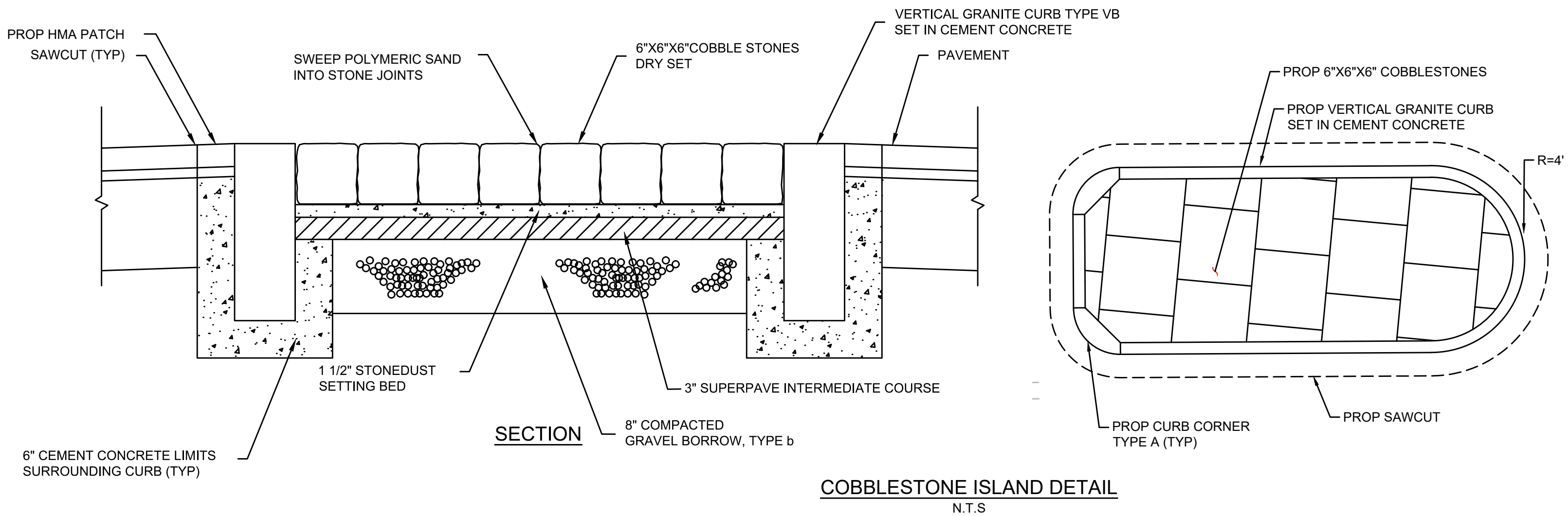
- NOTES:**
1. ALL 12" LINES SHALL BE APPLIED IN ONE APPLICATION. NO COMBINATION OF LINES (TWO - 6" LINES) WILL BE ACCEPTED. ALL 24" LINES MAY BE EITHER ONE 24" LINE OR A COMBINATION OF TWO - 12" LINES.
 2. LAYOUT OF CROSSWALKS SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION.
 3. CROSSWALK BARS SHALL BE PLACED OUTSIDE THE VEHICULAR WHEEL PATH WHEREVER POSSIBLE.

CROSSWALK PAVEMENT MARKING
N.T.S.

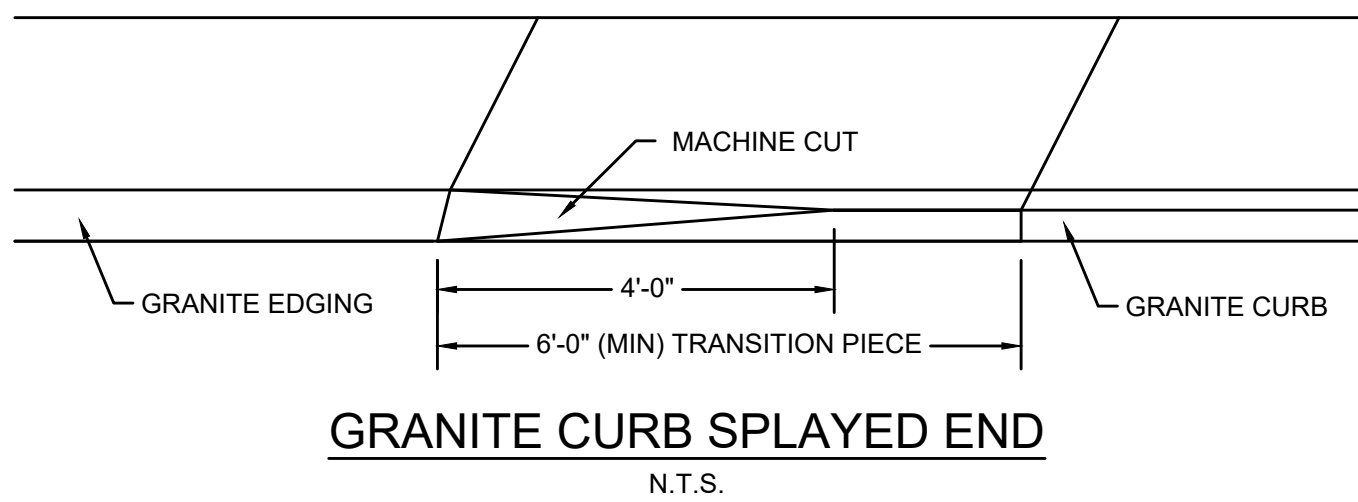
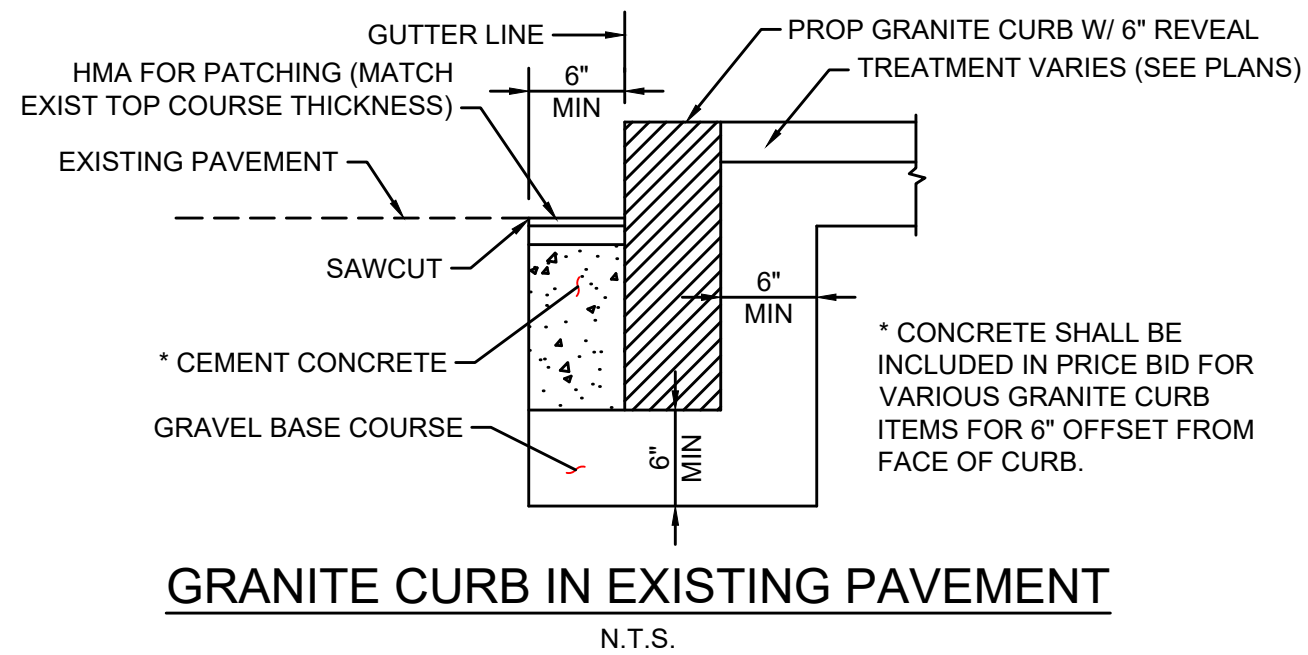


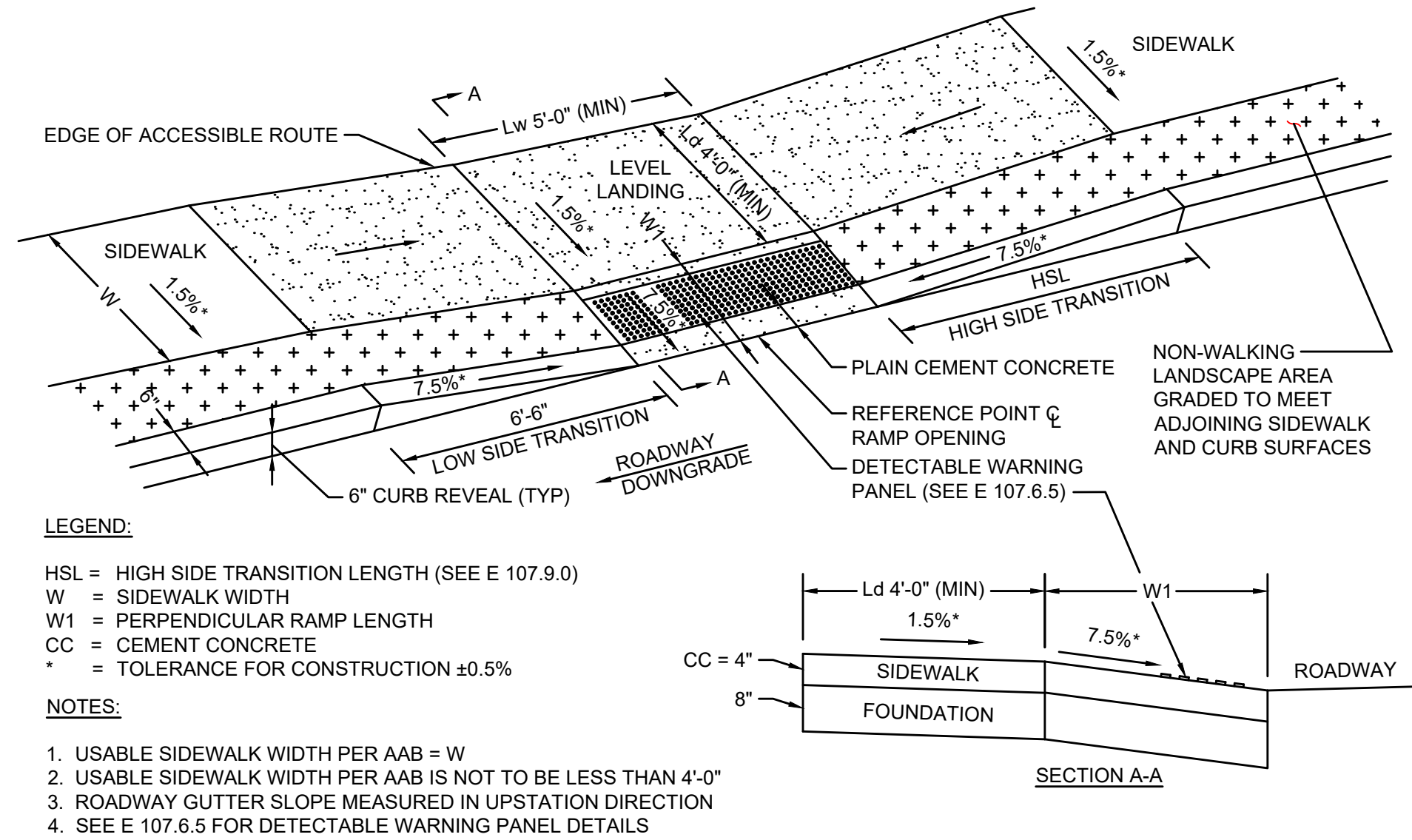
- NOTES:**
1. ALL CONCRETE TO BE CAST-IN-PLACE (MIN 3000 PSI)
 2. CONCRETE THRUST BLOCK TO BE USED ONLY WHERE IT WILL BEAR ON UNDISTURBED EARTH.
 3. CONTRACTOR SHALL SHIELD HYDRANT BASE DRAIN HOLES, MECHANICAL JOINT GLANDS, AND BOLTS DURING PLACEMENT OF CONCRETE THRUST BLOCKS. DRAIN HOLES, GLANDS AND BOLTS, SHALL BE VERIFIED AS OPEN AND FREE OF OBSTRUCTIONS PRIOR TO BACKFILLING.

HYDRANT REMOVED AND RESET
N.T.S.



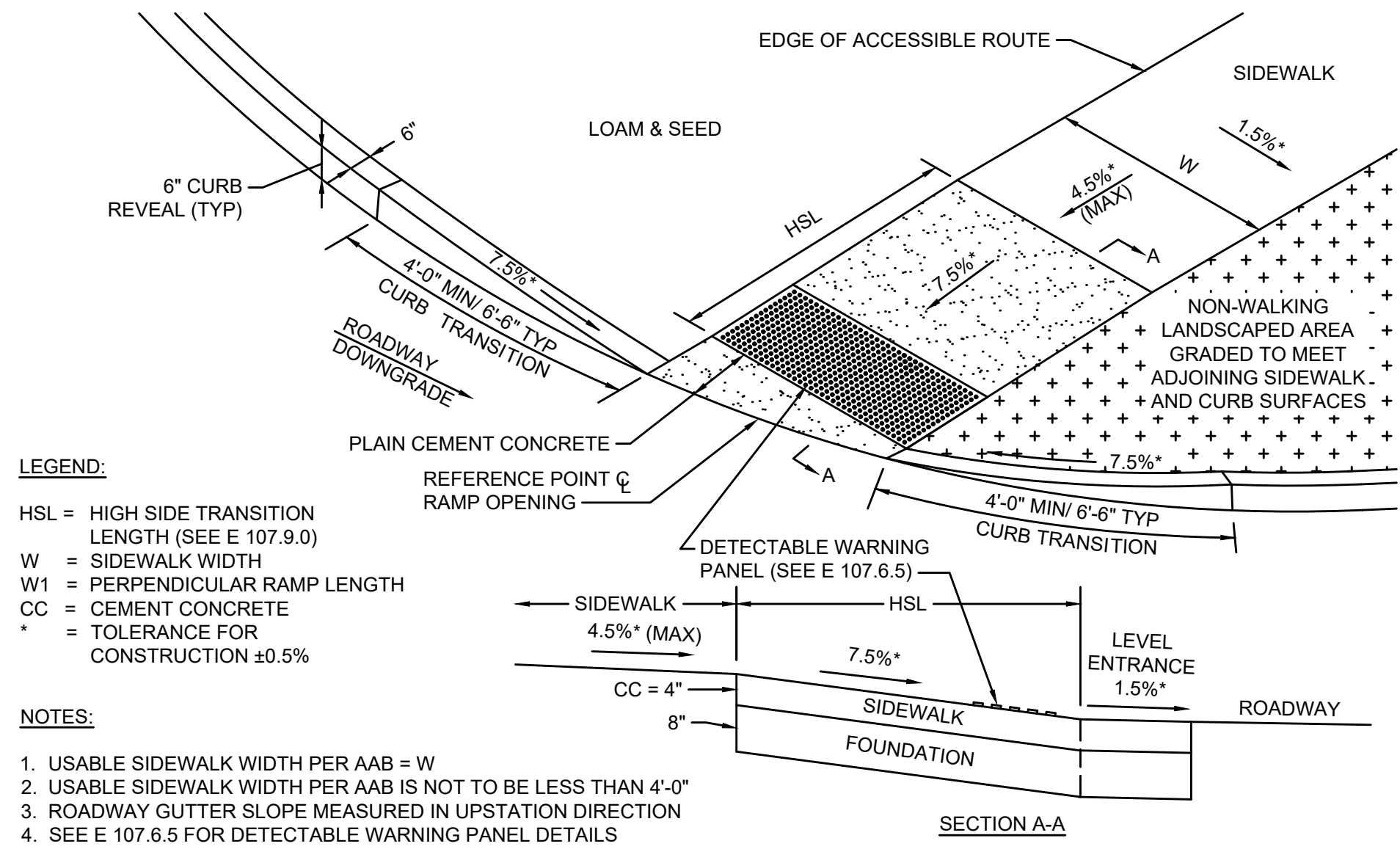
PROPOSED PLANTING SUMMARY TABLE						
QTY	KEY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
8	JC		JUNIPERUS CONFERTA 'BLUE PACIFIC'	BLUE PACIFIC JUNIPER	15" 18" CONT.	2' SPACING
12	SS		SCHIZACHYRIUM SCOPARIUM 'CAROUSEL'	CAROUSEL LITTLE BLUESTEM	#1 CONT.	18" SPACING
12	HR		HEMERCOLLAS 'RUBYSTELLA'	RUBY STELLA DAYLILY	#1 CONT.	12" SPACING





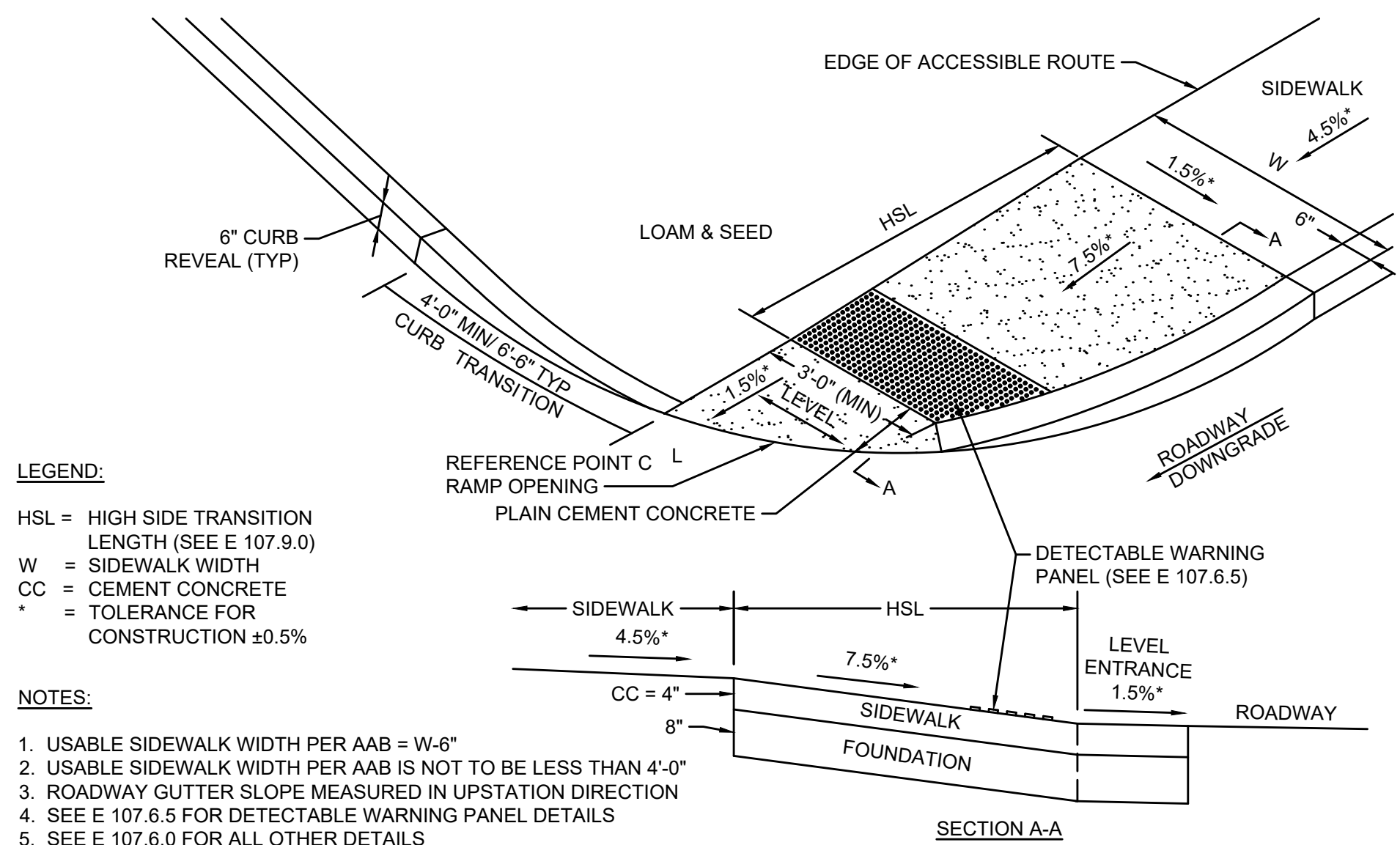
WHEELCHAIR RAMP TYPE A

N.T.S.



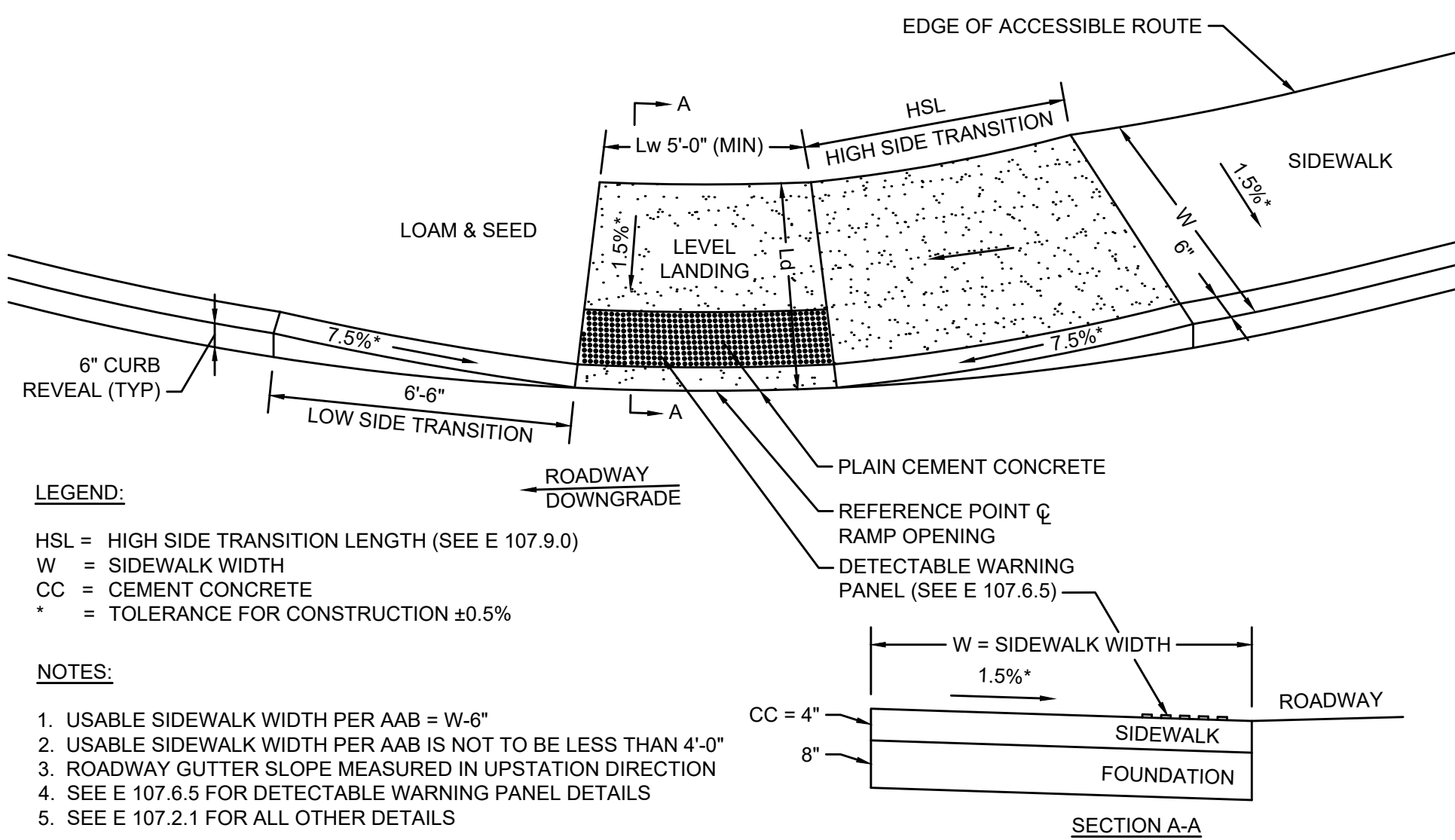
WHEELCHAIR RAMP TYPE B

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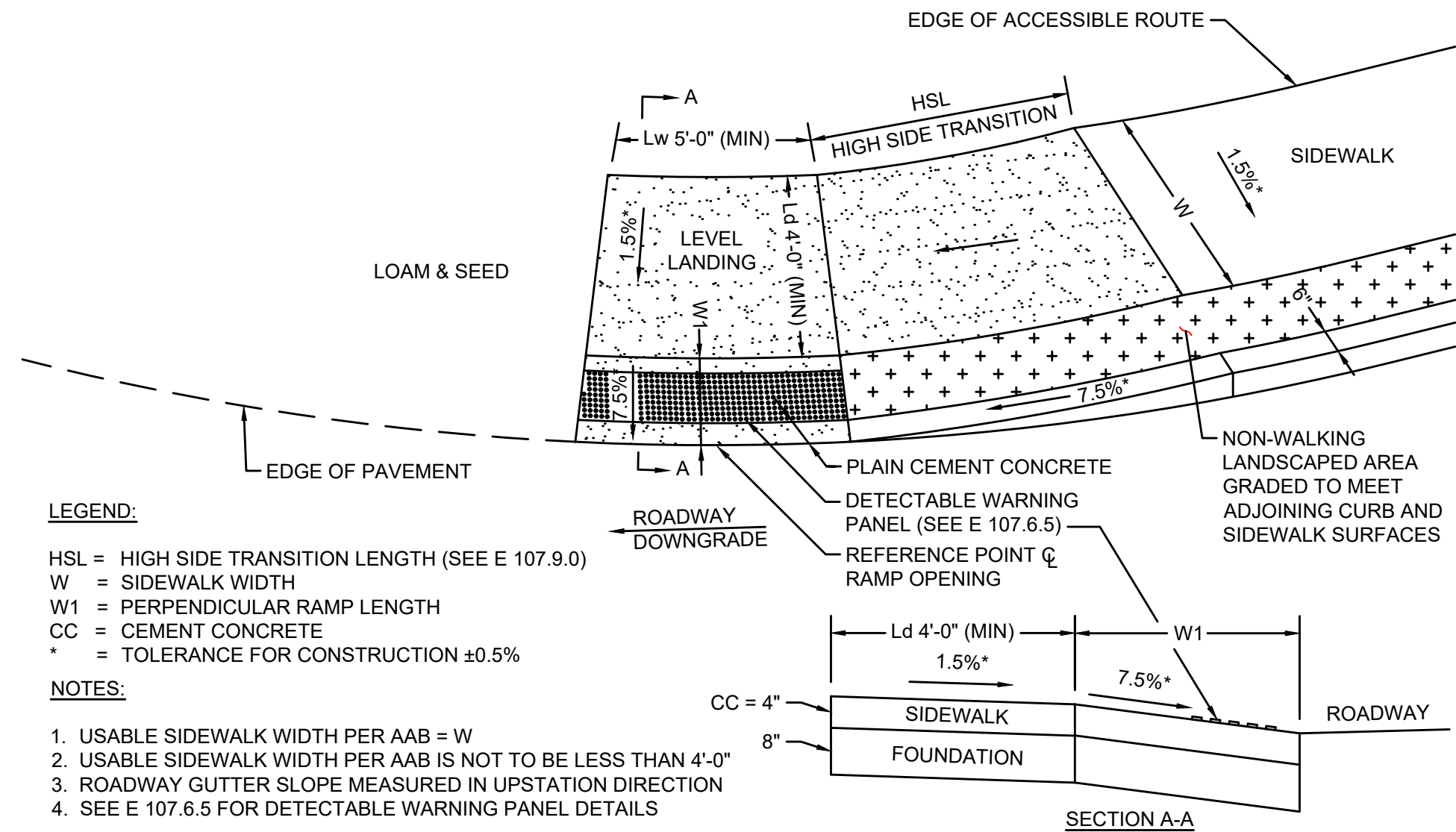
WHEELCHAIR RAMP TYPE C

N.T.S.



WHEELCHAIR RAMP TYPE D

N.T.S.



WHEELCHAIR RAMP TYPE E

N.T.S.

